

COMMERCIAL CAR JOURNAL

THE MAGAZINE FOR FLEET OPERATORS

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FEBRUARY 1948

Read: Analysis of A.T.A. Roadeo Results — Pgs. 30-31

Exclusive "More-Load" design paid off for REO drivers at the A.T.A. National Roadeo. "More-Load" design shortens wheelbase and turning radius—means easier maneuverability in the tight spots such as this illustration shows. Operators save time . . . get greater payloads . . . longer tire life. No wonder both driver and fleet operator cheer for REO—*"The Truck of Champions!"* *Reo Motors, Inc., Lansing 20, Mich.*

REO

(Shown: REO Models C21 & 22)

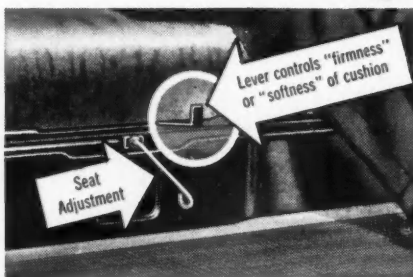


Much That's New...and "Job-Rated," too!



1. More Safety from the All-'Round Vision of New "Pilot-House" Cabs!

Note the tremendously increased *vision* of new Dodge cabs. Windshields and windows are higher and wider. New rear quarter windows are available, adding still more to vision and to safety. You get true "Pilot-House" vision in all directions. They are the safest cabs ever built.



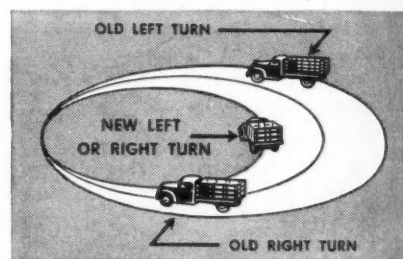
2. More Comfort from New Adjustable "Air-O-Ride" Seats!

"Air-O-Ride" seats give the kind of comfort you want. You may have a "soft" seat . . . or you can ride on a "firm" or "medium" seat. You control cushion "give" by a lever at the bottom of the front seat. Seven full inches of seat adjustment provide the right legroom for every driver.



3. More Safety . . . More Comfort . . . from New All-Weather Ventilation!

Whether the thermometer is ten below or a hundred above—you're *comfortable*! That's because of the availability of an ingenious combination of fresh air intake, newly designed hot water *truck* heater, with powerful fan and defroster tubes, vent windows and cowl ventilator.



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"Job-Rated"
TRUCKS
FIT THE JOB . . . LAST LONGER

COMMERCIAL CAR JOURNAL

with which is combined Operation & Maintenance

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FEBRUARY, 1948

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Hard Knocks— the tailgate gets more than its share!

Opening freely and closing tight in spite of years of hard knocks—that's the body tailgate's part in keeping St. Paul users coming back for more.

Heavy Duty Tailgate illustrated has angle steel frame with box-type vertical braces. All St. Paul 'gates are double acting—hinged top and bottom. Hinges and fittings are heavily flanged steel castings. Spreader chains may be set for any opening desired.

There's a St. Paul Body and Hoist for every earth moving job!



DUMP UNITS...TRUCK PATROLS

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←CHESTER W. SMITH, left—winner of National Truck and Full Trailer title—has been driving for 19 years (five years with the Reliable Transportation Company of Los Angeles, four years without accident). Like other two first place winners, all three national runners-up, and 22 others of 49 state champions, he drove a REO to win championship.

↑Three-time winner of the Tractor Semi-trailer division CHARLES W. ZIMMERMAN, left—congratulates ALEX E. ADAMSKI, fellow Chicagoan, the new Straight Truck Champion. Zimmerman, 39, has 16½ years experience, 14 years without accident, drove for Cushman Motor Delivery Company. Adamski, 34, has a three-year accident-free record with George F. Alger Company, Chicago.

Analysis of ATA National Truck Rodeo Results

Why did one make of truck star in all events? Here are some interesting conclusions from an examination of Rodeo results.



KENNETH CLAY, JOHN R. WINTER, NORBERT TOTZKE—three more champions who prefer REO. Winners of second places in (respectively) Truck and Full Trailer, Tractor Semi-trailer, and Straight Truck events. Each is top man in his class in his own state. Totzke, of the George F. Alger Company, Chicago, came in only half a point behind Champion Adamski in the finals. Winter (Dohrn Transportation Company) is from Rock Island, Illinois. Clay drives with the Associated Trucking Lines, is Michigan Champion of Truck and Full Trailer Class.

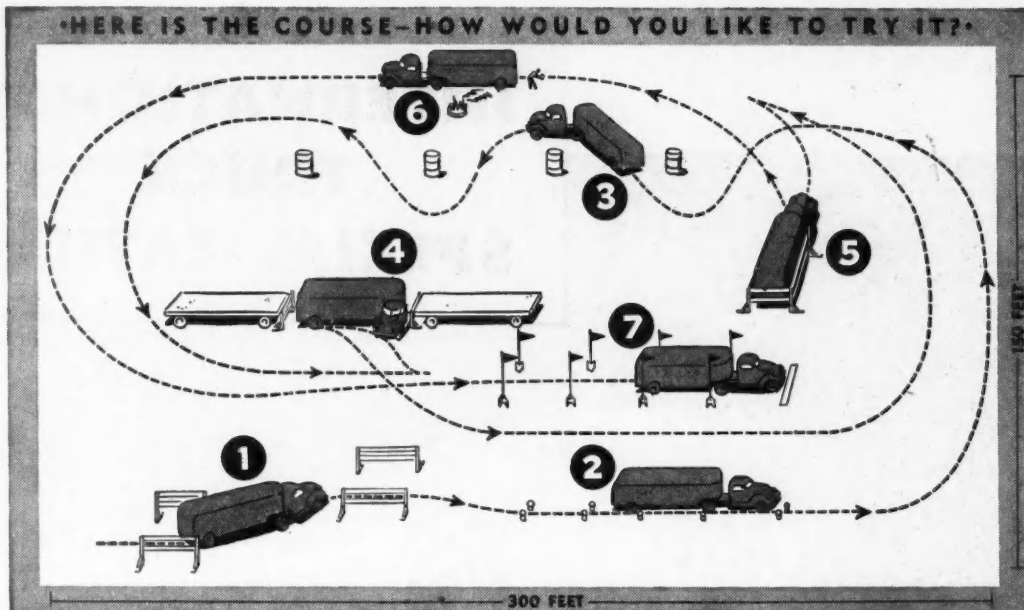
THE PHENOMENAL skill of the contestants in the finals of the National A.T.A. Truck Rodeo provided genuine thrills for the crowd of 5,000 who witnessed the contests. The winners, pictured on these pages, are without doubt among the world's best drivers . . . as to driving skill, courtesy, safety, knowledge.

The contests themselves are of great value to the trucking industry. They bring public attention to the professional proficiency of the drivers . . . and all drivers get a goal of safety and expertness to shoot for.

While Rodeos have answered the question, "Who are the best drivers?"—they have brought up other questions. One was: "Why did 28 out of 49 Champions win their titles driving *one* make of truck, when every major make was available?"

That 53% of the state champions won their honors in REO trucks through pure coincidence seemed unlikely *before* the national contests. In the light of REO'S 100% sweep of first and second places at the national Rodeo, it's obvious that there are other reasons.

It would be foolish, of course, to assume that REO trucks were altogether responsible.



1. *Offset Alley Problem*: to test driver's ability to get through the limited space of an offset alley at a 45° intersection. Fined for jerking or stopping (here's where that REO Gold Crown Engine's smooth power pays dividends) and for scraping or running over markers (REO's *full-vision* is a godsend here). 2. *Straight Line Problem*: to see if driver can accurately maneuver his right wheels over a straight, narrow path. Demerits for wavering from line (the fine balance of a REO and its straight-line stability—due to the "More-Load" design—help to hold a die-straight course). 3. *Forward Serpentine*: to test driver's ability to steer his truck in close limits. Continuous forward motion, exceptional visibility again needed for top scoring. Easy and accurate steering with smooth-operating steering gear counts for plenty in this event. 4. *Parallel*

Parking: a really difficult parking test, calling for everything a driver can get from his vehicle. REO's "More-Load" design offers a shorter wheelbase, shorter turning radius; means less jockeying, fewer maneuvers. 5. *Alley Dock*: to test ability of driver to back down narrow alley to within six inches of loading dock. Quicker response to turns, smooth operation of Gold Crown Engine, excellent visibility, shorter overall length mean more points in this event for REO driver. 6. *Fire-fighting Problem*: roomy cab and wide doors give easy entrance and exit in emergencies. 7. *Diminishing Clearance and Stop Line*: another tricky bit of steering; calls for true and stable steering gear and a well-balanced chassis. Exceptional over-the-hood *full-vision* and reliable, smooth-working brakes can reap some extra points.

Twenty-three of the twenty-nine contestants who drove a REO in the finals did not win firsts.

Champions in the trucking field, like champions in sport, become more particular about their equipment the better they become—and more likely to demand features not found in all equipment. This was amply borne out at both State and National Rodeos. The higher the

contest level, the fewer makes of trucks were selected by the drivers. In the state contests, for instance, almost 50% of the winners were divided between trucks *other than* REO; while in the Nationals, *every* winner and runner-up chose a REO to help him win!

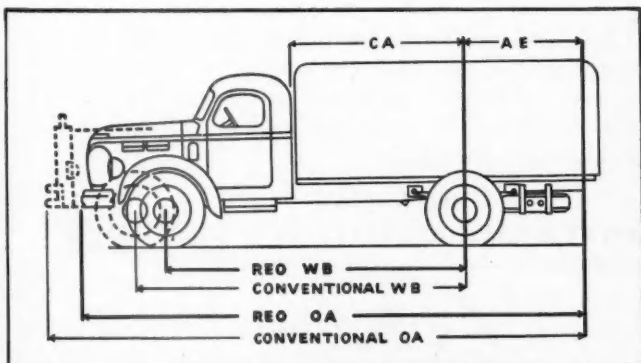
"More-load" design is an exclusive REO feature. Its advantages are not all felt in the Rodeo. But the

maneuverability it gives a REO is believed to be one reason so many Rodeo champions picked REO.

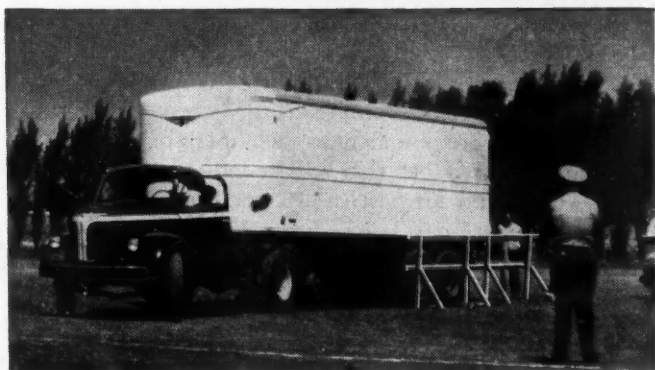
"Truck of Champions"

REO

REO MOTORS, INC., LANSING 20, MICH.



Diagrammatic representation of REO "More-Load" design. This exclusive REO feature gives all REO trucks extra time-saving maneuverability, fine balance, better load distribution, and greater load capacity per inch of wheelbase.



REO Model 25 with trailer, being backed into make-believe alley-dock at a Truck Rodeo. Stop must be made within *six inches* of the simulated dock. Like other REO models, it has exceptional visibility; roomy, comfortable cab; readily accessible engine.

INTERNATIONAL TRUCK SPECIALIZATION



INTERNATIONAL TRUCKS are completely *specialized*. Here's how:

They're *Performance-Co-Ordinated*. That means that engines, transmissions, axles and all other components are expertly fitted to the work each is to do.

They're *Load-Co-Ordinated*, by the exclusive International Truck Point Rating System. That means an accurate statement to each operator about the amount of payload that will be most profitable for *his* trucks on *his* particular operation.

Yes, International Trucks are sold *right*, specified *right* and serviced *right*.

Add the foregoing to the 41 years of demon-

IS *Complete* SPECIALIZATION

strated International Truck performance, economy and dependability, and you have the reason why:

More new heavy-duty Internationals have been purchased by American commerce and industry for the last 16 years than any other make.

Motor Truck Division

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INTERNATIONAL Trucks

Tune in James Melton on "Harvest of Stars." NBC Sundays.



CCJ READER DIGEST

DO YOU KNOW THE ANSWERS?

- Do engine governors cut horsepower? P. 40
- Can you name five basic reasons why fleetmen should oppose toll road projects? P. 48
- Can your mechanics diagnose engine bearing failures through appearance of the old bearing? P. 53

Splash Guards in the Northwest

By S. C. PUFFER

BOTH Oregon and Washington now enforce laws requiring the installation of splash guards on all vehicles. The general requirements are that they be as wide as the rear wheels and extend downward to at least 16 in. from the ground. Operators are left to their own devices as to how they comply with the requirements. Results reveal a variety of guards fabricated, in the majority of cases, from surplus rubber material formerly used in airplane gasoline tanks, and, in the case of tank trucks, from sheet steel. Surplus belting and canvas strips have also been used.

Virtually all of the fleetmen in these states agree that the splash guards accomplish little from a safety standpoint, diverting spray out the side where it may be even more dangerous than to the rear. But many, especially the largest operators, feel that the guards do have a definite good-will value. See page 34.

Vehicle Replacement

by JOEL DEAN, Prof. of Business Economics, Columbia University

THE problem of when to replace a truck is essentially a problem of control of internal capital investment. A new truck must compete for funds with alternative capital projects on the basis of profits. The capital budgeting plan is based on the projection of future expected costs for both old and new vehicles. The behavior of costs with increased use of vehicle is the key to determining the savings that should govern replacement.

This plan not only shows how projections of future costs may be used to determine the ideal replacement point, but also, how the projection may be adjusted to variations in disposal value due to market conditions and to increased costs for such items as wages, productivity and prices. See page 36.

Centralized Equipment Control

by LESLIE D. CONYERS, Consolidated Freightways, Inc.

WITH its new ultra-modern dock and shop facilities, Consolidated Freightways management recognized the need for a highly-accurate centralized control system to assure maximum speed in the handling of all over-the-road vehicles at its big Portland, Ore., terminal. As a result, the office of the Equipment Coordinator was set up with full authority and all devices necessary to accomplish this end and at the same time to referee any disputes arising between dock management and shop management.

CHECK YOUR KNOWLEDGE

- How are new reflective materials applied to trucks and do fleet users like them? P. 58
- What is the most important step in overcoming low-temperature sludge formation? P. 64
- How much have Dodge & Ford raised prices? P. 72

Feature of the control room is a huge panel laid out to conform with the physical aspects of the Portland yard. On it are pins and tabs which correspond to the actual location of each vehicle. There are also zone panels showing the routes over which each vehicle not in Portland is travelling, as well as the necessary dispatch and control forms necessary to keep pace.

It is the coordinator's job to assure maximum usage of both dock and shop facilities. Normally inbound vehicles are first routed across the service pits where 1 hr. 30 min. is the maximum time allowed. If more time for repairs is necessary or if more vehicles than the shop can handle are in, adjustments are made on the spot to assure most efficient handling. This requires that every movement be reported to the coordinator over an inter-communications system. After approximately one year of operation, the control system has been described as highly successful. See page 38.

Experience Guides Oil Change Schedules

by A. W. GREENE, Managing Editor, Commercial Car Journal

THE nation's top fleets rely upon their own experience, more than any other factor, when it comes to deciding on oil change periods for their vehicles. Of the 10 factors listed by the Board of Experts, 33.96 per cent work on this experience basis. Predetermined mileage schedules and discolorations are the next two most frequently mentioned factors.

Table 1 lists all 10 oil change factors according to vocational groups. Table 2 gives the oil change frequency schedules.

What fleets are doing with their used crankcase oil is shown in Table 3. The trend, based on pre-war practice, is in the direction of reclaiming and selling. See page 49.

Figuring Fifth Wheel Offset

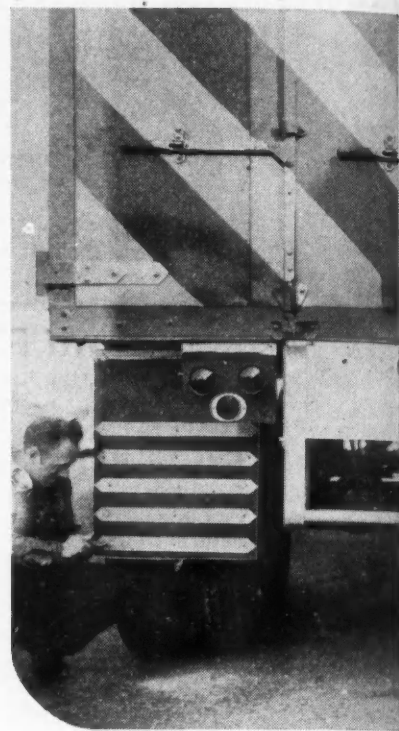
by MERRILL C. HORINE, Mack Mfg. Corp.

PROPER location of fifth wheel with relation to tractor rear axle affects many characteristics of the performance of the vehicle train, including load distribution, steering, traction, braking, turning radius, maneuverability and riding qualities. At the same time the location is strictly limited by vertical clearance angle, cab clearance, clearance of underbody trailer parts and coupling heights.

This article presents formulae for the determination of both the ideal location and the practical location as determined by existing design practices which place the maximum offset at approximately 14 in. ahead of the rear axle center. See page 66.



SHEET METAL guard, welded to tank is used by Petroleum Transport Co. of Seattle. This one is Kenworth design



SURPLUS RUBBER guard, reinforced with stainless steel strips, is choice of Consolidated Freightways in Portland

Splash Guards:

How Northwest Operators Equip Their Vehicles

V IN 1937, Washington passed its first "Splash Guard" law: "Every vehicle shall be equipped with a device adequate to effectively reduce the wheel spray or splash of water from the roadway to the rear thereof." (Chapter 5, Sec. 44 - 1937.)

Rigid enforcement began in April, 1946. Why not until then? The war; difficulty in obtaining splash guard material; or some other reason you can think of—but whatever the reason, on April 1, 1946, every truck owner was notified by letter and immediately thereafter the law was enforced, at first by warnings,

by S. C. PUFFER
CCJ Special Correspondent

and after July 1, by outright arrests.

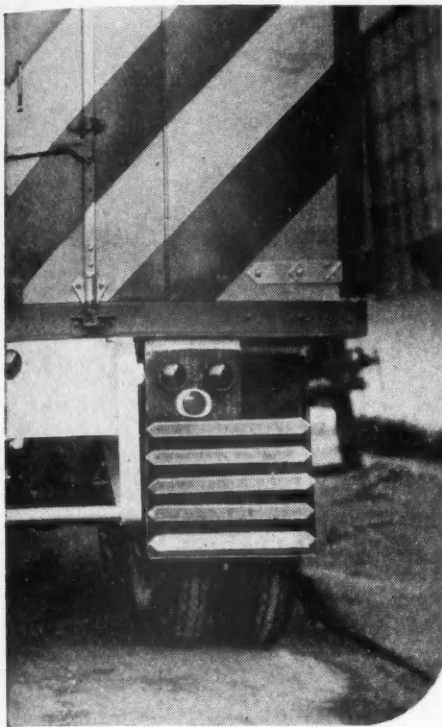
Today it is the rare exception to see a truck on a Washington highway without some sort of splash guard attachment. There is no requirement as to the material. Guards may be made of canvas, rubber, leather, composition material or metal plate.

It is required that the guard extend downward to within not less

than 16 in. from the ground, and that they be as wide as the tire, or tires which they cover.

The larger fleet operators have pretty well standardized on a composition material which is being sold as war surplus. It is a rubberized bullet-proof material used on military planes for gasoline tanks.

For the average truck or trailer, covering two wheels on each side, two pieces, 26 in. wide and 35 in. long are required. The material is approximately 1/2 in. thick. A pair of guards of the above size will weigh approximately 30 lb and cost in-



SGT. BLACK of Washington State Patrol checks 16-in. minimum ground clearance of conventional flap guard



COMBINATION guard used by Lee & Eastes, Portland, has sheet aluminum top, composition shoe sole bottom

Fleetmen find surplus rubber, belting or canvas best for regular rigs, light steel or aluminum for tankers, in complying with newly-enforced Oregon and Washington laws



OLD BELTING does the trick for splash guards on dump truck of Halroyd Sand & Gravel Co., Tacoma

stalled from \$12 to \$14 per pair.

There are two common methods of installation: one, where the guard is bolted to the truck frame, one bolt at each top corner of the guard; the other, by attaching an angle iron to a frame cross member and bolting the guard to the iron.

Eight fleet operators in the Seattle-Tacoma area using conventional highway rigs were queried as to types of guards and methods of installation. Seven of the eight used the composition material described above. One used secondhand leather belting. Five of the operators at-

tached the guard directly to the truck frame, three used angle irons.

None of the operators queried reported any trouble with guards coming off or being torn, except dump truck operators.

Tankers Are Different

SPASH guards for oil transports and trailers are of an entirely different type owing to the shape of the rear end. Here the guard is usually of metal — welded to the tank with $\frac{1}{8}$ in. angle iron braces to support the weight.

(TURN TO PAGE 114, PLEASE)

METAL & BELTING fills the bill for Ross Island Sand & Gravel Co.'s mixer but damage is heavy in this service



Vehicle Replacement



Using the Capital Budgeting System

A noted economist presents a new concept of timing vehicle replacements based on the projection of expected returns from capital investments

▼ WHEN to get rid of a vehicle may not be the most important problem of motor vehicle management, but it is clearly the most controversial one. Dozens of articles and papers have been written on it. They present such widely different solutions that there appears no basis for agreement. And current practice is probably even more varied.

The principle justification for an addition to this imposing array of discordant doctrine is that this paper presents the solution of an economist. Viewing the problem as essentially one of applied economics, and looking at the matter through the eyes of top management, truck replacement is approached in this paper as an integral part of the broader problem of budgetary control of all the company's internal investments.

For simplicity the analysis summarized here is restricted. First, it is predicated on normal market conditions (i.e., availability of new trucks and market values of used vehicles normally related to new). Present abnormal conditions will not last much longer; hence the replacement problems of the future must be

by JOEL DEAN*

Professor of Business Economics
Columbia University

met under the assumed normal conditions. Second, the discussion is focussed on the fleet operator and is confined to replacement of existing trucks. Third, it concentrates on concepts, principles and the basic method and does not deal with procedures and forms.

The plan presented here was developed for a large fleet operator and is now in use.

The problem of when to replace a truck is essentially a problem of control of internal capital investment. Decisions on truck replacement should be an integral part of a company-wide capital expenditure budget which is designed to control and ration the company's limited capital funds among rival investment projects. A new truck must compete for funds with alternative capital projects and must prove its survival worth on the basis of profits i.e. earnings on the replacement investment that are superior to alternative uses.

Capital Budgeting

A BRIEF sketch of the basic theory of sound capital budgeting is therefore an essential prelude to our analysis. Opportunities for profitable internal investments will, if management is alert, exceed the company's limited capital funds. This will create a problem of capital rationing. Rationing should be on the basis of prospective profitability. Each candidate project should be made to stand on its own merits as measured on its future net return on capital. Capital should be apportioned by arranging projects in a ladder of profitability and by working down from the most profitable toward the least profitable.

The cutoff point on this rate-of-return ladder ought to set so that the standard of minimum return will remain stable over the business cycle. Carry-back and carry-forward provisions should take up the shock of year-to-year changes in need and supply of funds. Short-term borrowing should take care of a temporary excess of capital projects whose rate of return exceeds the standard. By this approach a company can make sure that the struggle for survival among alternative uses of capital funds will

(TURN TO PAGE 150, PLEASE)

*Excerpted from a paper presented at the SAE annual meeting in Detroit, Jan. 12-16.

Annual Costs of Keeping Old Truck Additional Years

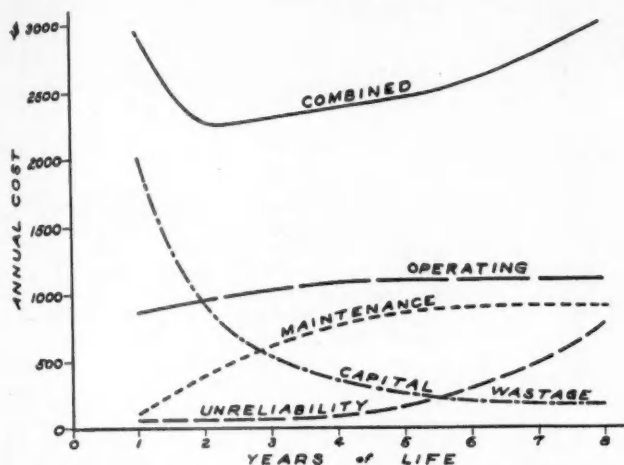


FIG. 1. Basic chart shows cost of keeping the old vehicle. Capital wastage curve is based on market-price depreciation

Cost Savings From Truck Replacement

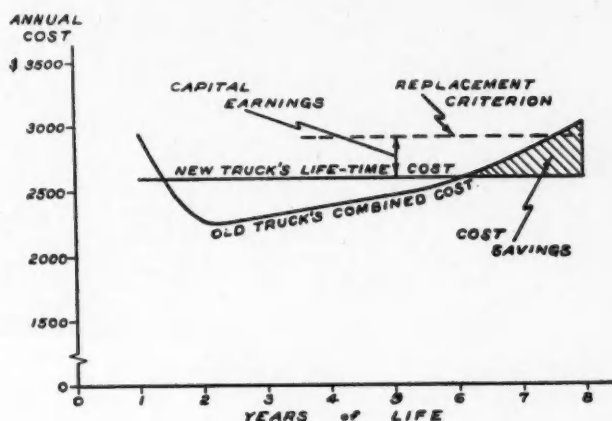


FIG. 2. Comparison of old and new truck cost. New truck cost is based on total estimate divided by life expectancy

Capital Wastage Derived From Disposal Value

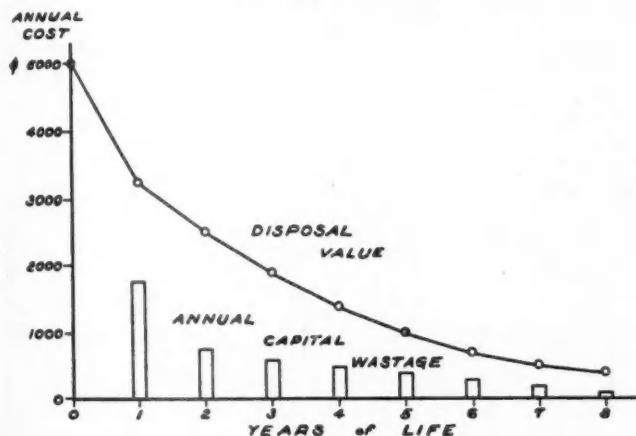


FIG. 3. Normal disposal value of light truck at end of each year (top curve) and annual loss in value (lower bars)

Shifts in Disposal Value Function

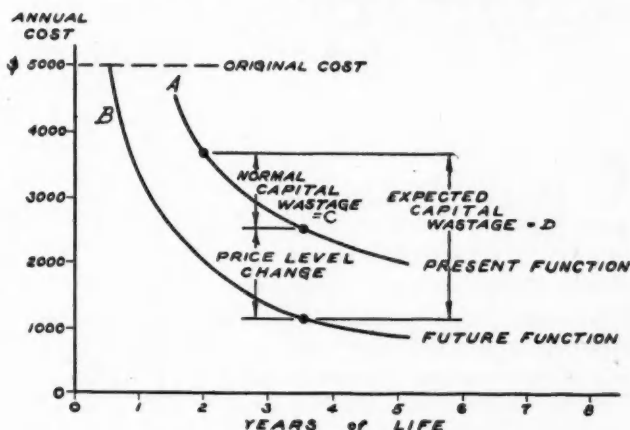


FIG. 4. Compensation for future economic changes is provided by present-level curve A and future-level curve B

Annual Depreciation and Capital Wastage

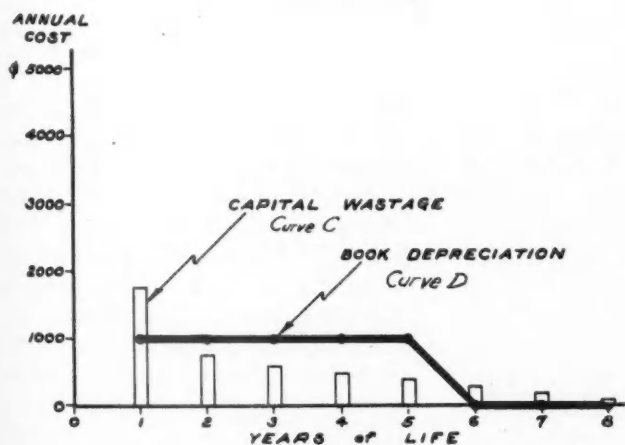


FIG. 5. Actual market values (bars) and book depreciation (curve D) will eventually be equal. Difference is in timing

Shift in Maintenance Cost Caused by Wages, Productivity, Prices

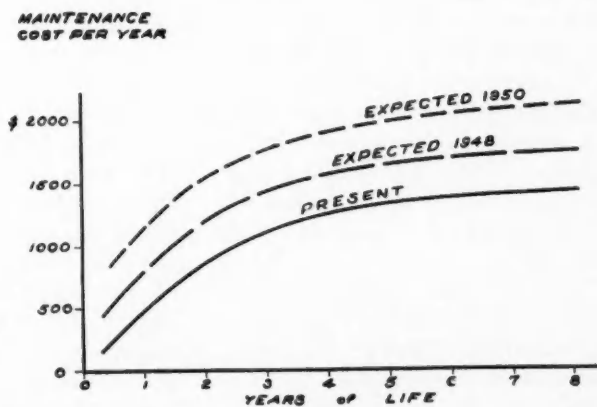


FIG. 6. Expected changes in costs can also be projected. Projection involves hopping between curves and age brackets

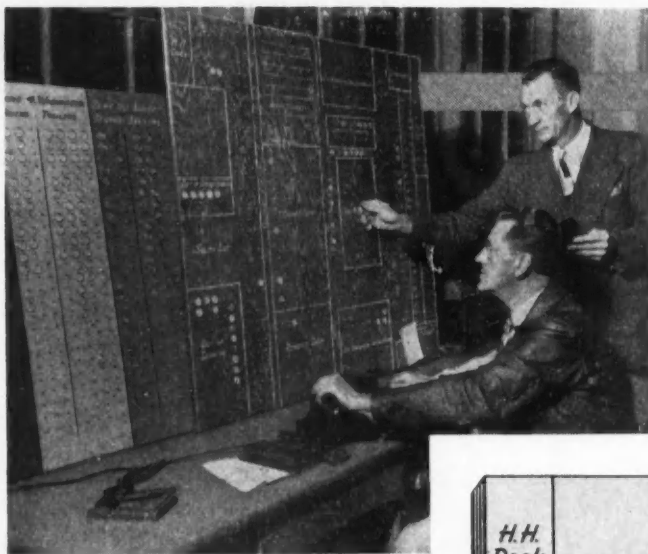


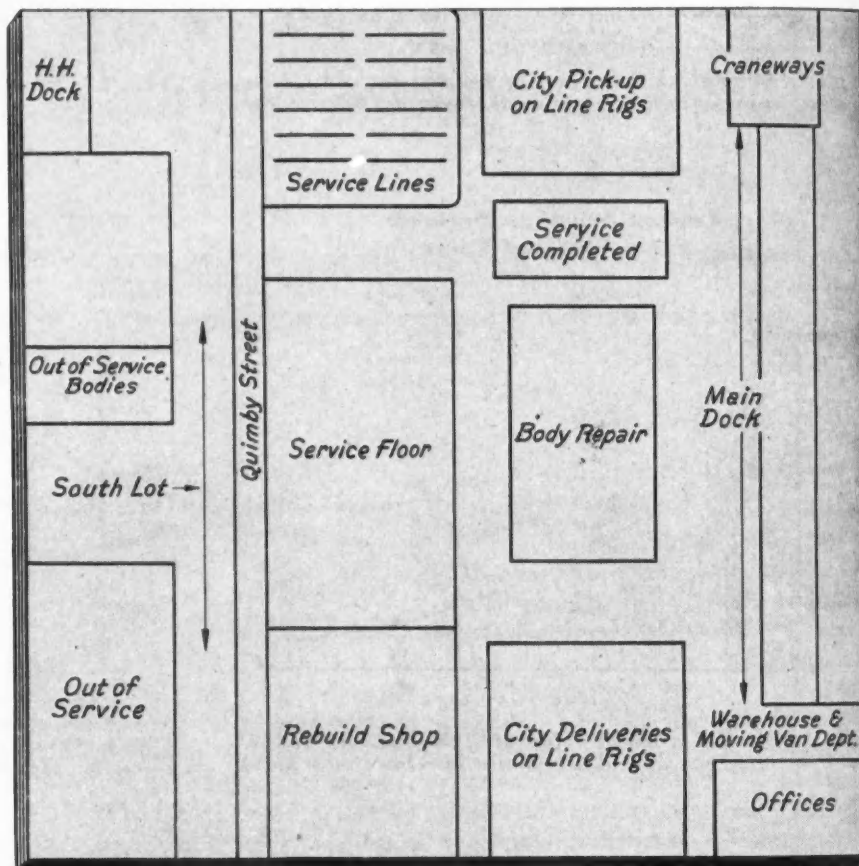
Fig. 1. The author, Leslie Conyers, (standing) briefs his assistant, A. O. McMurry on exact status of every vehicle in Portland area. Two of the five zone panels may be seen at far left. Enlarged drawing (below) shows details of control board. For full explanation, see text

by LESLIE D. CONYERS
Equipment Coordinator
Consolidated Freightways, Inc.
Portland, Ore.

VNEW and ultra-modern loading dock and shop facilities at Consolidated Freightways' headquarters in Portland, Ore., offer the very latest methods in handling freight and the servicing of equipment. Since these two departments are housed in separate buildings, it requires the greatest cooperation and coordination in unloading and servicing, and reloading equipment to assure the successful operation of both maintenance and freight handling departments with minimum cost and maximum schedule performance. About 460 over-the-road vehicles based at Portland are involved.

Realizing the problems involved, and that efficient operation depends on the coordinated movements of the equipment while these operations were in progress throughout the day, company officials set up the Equipment Control Room, supervised by the "Equipment Coordinator." This office was to have absolute control of "over-the-road" equipment while in the Portland area, and no equipment was to be moved without the consent of the Coordinator.

It was also the duty of the Coordinator to be the judge or referee in disputes that might arise between the



foremen of these departments, and his knowledge of the issues in question must be such that his decision would be fair and to the advantage of all concerned. Also, his decisions as to the distribution of equipment must be quick and correct; mistakes on the part of the Coordinator could cause loss of time, increased costs and poor schedule operation, which in turn would have its effects on delivery of freight to outlying stations.

The Equipment Control Room was officially opened on Oct. 15, 1946,

and the Coordinator was given all the time necessary to acquaint himself with the supervisors of the different departments affected by his office, and to study the operations and the problems confronting the shops and dock.

After several months of study, experiment and hard work, a carefully-worked-out plan was drafted and is now in successful operation.

These are the basic objectives of the plan:

1. Orderly flow of equipment

CONSOLIDATED FREIGHTWAYS, INC.					Form 665	
DAILY EQUIPMENT COORDINATION SHEET - SHOP					194	
Trlr. No.	Loads	Time Equipment			Cause of Service Delay	Time Rel's'd To Dock
		Entered Service Line	Rel's'd to Dock	Ret'd to Serv. Floor		
225	Terminal 4	6:AM	7:15AM	12:30 PM	5 Brake Reline	3:30 PM
85	Miscellaneous	8:20AM			Service Only	8:50 am
389	Term 1	3:40 PM			✓	4:20 PM
369	West Coast Term	2: PM	3:15 PM	3:40 PM	one Brake Reline	4:50 PM
327	Miscellaneous - Light	4:15 PM	3:45 PM	4:00 PM	Repaired on Site	4: PM

Form 675

CONSOLIDATED FREIGHTWAYS, INC.
 DAILY EQUIPMENT COORDINATION SHEET - DOCK

Road Equipment						Nov. 28, 1947		
Truck Trailer No.	Loads Specify City or Dock	Tonnage To Del. or Pickup	Released to Dock	Depart to Pickup or Del.	Returned to Dock	Return to Shop	Causes of Delay	Shop Service Completed
325	Terminal 4	20,000 ⁺	7:15 AM	8:30 AM	12:45 PM	12:50 PM		3:30 PM
85	Miscellaneous	21,200 ⁺	7:50 AM	9:25 AM	3:10 PM	✓		4:50 AM
399	Terminal 1	17,900 ⁺	6: AM	5:30 AM	12: PM	3:40 PM	Released to Load	4:20 PM
369	West Coast Terminal	11,500 ⁺	6: AM	7:30 AM	3:40 PM	And at full creek		5:50 PM
327	Miscellaneous Light	✓	6: AM	7:30 AM	3:40 PM	4:15 PM	Unloaded for ship Room	6: PM

Fig. 4. Dispatch Priority Sheet (below) gives destination, tractor, trailer and schedule numbers for outbound trips

CONSOLIDATED PRIORITY SHEET					Form 100
CONSOLIDATED PRIORITYS, INC.					Rev. 10/67
Date <i>4-24-68</i>	Flight and Piece Information			City	
Destination	Flt. No.	Trl. No.	Scr.		Remarks
ZONE 1 - OUTSIDE LOCAL					
Boyd	312	15	231		<i>233 121</i>
Boyd <i>Boyd</i>	312	15	231	<i>233</i>	<i>121</i>
Seaside	422	261	229		<i>233</i>
Seaside <i>Seaside</i>	422	261	229		<i>233</i>
Interpines	101	183	233		<i>217</i>
Good River	312	261	229	<i>233</i>	<i>121</i>
Medford	16	471	201		
Pendleton	312	281	212		
Roseburg	86	603	206		
The Dalles	14	67	320		
	312	161			
Omarie	312	281	228		
	312	203	231	120	
Coos Bay-Kay	312	203	231	120	
Medford-Kay	312	203	231	120	
Medford-Kay	312	203	231	120	
Medford-Kay	312	203	231	120	
S. Valle-Kay	312	203	231	120	

CENTRALIZED

Equipment Control

Coordinates Shop and Dock Activities

Control room referees departmental disputes and schedules movements to assure maximum efficiency in loading and servicing of some 460 heavy over-the-road trucks and trailers.

through the service line, service floor and to the dock.

2. Elimination of slack periods in the maintenance and repair department of the Portland terminal.
3. Release of as many units by the shop to the dock as early as possible each day.
4. Prompt delivery of all full load lots to customers.
5. Prompt unloading of all LTL cargo.
6. Release of all equipment daily, that hasn't been serviced as early as

possible, by the dock to the shop.

7. Prompt return to the dock of all road equipment out on big mark pickups.

8. Maintenance of a higher degree of on-time schedule performance. In implementing the plan the

Equipment Coordinator was given charge of the movement of every piece of road equipment through the Portland terminal until such time as it is released to the dock for final loading. No moves from service line
(TURN TO PAGE 108, PLEASE)

Experts Answer Fleetmen

We have been asked—"Do engine governors cut horsepower?" Knowing that this problem has been tossed around a great deal and that many times controversial answers have come up, CCJ has asked factory engineers for their views. Here are the answers as provided by the experts.

There are many such problems troubling fleetmen today. This department has been originated for the purpose of clearing up just this sort of problem. Letters from fleetmen have already initiated other studies for The Conference Corner. Send us your question and let us give engineers a chance to discuss it on these pages.

Next month technicians will discuss the question: "Are down-draft carburetors more efficient than updraft types?" Watch for an interesting discussion.

**Any Loss Is
Hard to Detect**
by F. E. Williams
General Sales Mgr.
Zenith Carburetor

"Generally speaking, the characteristics of all velocity governors, due to the throttle plate angle at which they operate, do cut into power a little bit. This loss, however, would be hard to detect in operation as it would be about two to three horsepower at the peak power point.

"Drivers generally don't like governors but this is largely due to lack of education. If they learn that the purpose of the governor is to protect the engine, rather than to 'cramp the style' of the driver, they do not object. Drivers of governed vehicles must be given schedules which they can make with the governor in operation with reasonable allowances for traffic and necessary stops. A lot of drivers resent governors because they cannot make up the time lost by delays. That kind of driver is the one who needs the governor most if the engine is to be protected.

"With a good governor it is not easy to attain excessive down-hill speeds to carry the truck up a succeeding grade. This means a bit more gear shifting but it does protect the engine and that is of vital concern to the fellow who has to foot the repair bills. The governor is not intended to make life easy for the driver. It is intended to protect engines. However, it does make the driver's job easier to the extent that he does not have to watch carefully engine speeds to keep within a safe operating range."

**Affect Top Speed
Not Pulling Power**
by C. E. Johnson
Hoof Products Co.

"Up to the speed at which the governor is set, there is no loss of engine power through the use of the Hoof Governor because there is no restriction of the effective area of gas passage in the governor as compared to the carburetor and manifold openings. There are some governors, better classified as restriction devices, which are notorious "power stealers"—but modern governor construction makes possible the same engine power output within $\frac{1}{2}$ to 1 hp at the governed speed, that it is possible to secure from the engine without the governor installed. (In speaking of the modern

The Conference

QUESTION: Do Engine Governors Horsepower and

Verdict of Conferees

Some engineers say that any velocity type governors cut horsepower to some extent because of the restriction of the effective area of gas passage in the governor as compared to the carburetor and manifold openings.

Others insist that this type of governor affects top-speed—not the pulling power of the engine. Another manufacturer implies that loss of power would be hard to detect—if the engine is in peak operating condition.

Centrifugal governors, properly made, properly installed and properly set do not materially affect hp., says another.

governor, this constitutes the few governor manufacturers who have developed full power governors and have adequate laboratory facilities and testing equipment to prove this conclusively.) While it is true that an engine is capable of developing more power at 60 mph than it develops at 40 mph, this power is reflected only in speed and not in pulling ability or power on the hills. Any horsepower available beyond the point of torque peak is simply momentum. These factors depend upon torque rather than power, and the peak of the torque curve is invariably reached at some speed below the governed speed of the vehicle. A governor, therefore, affects only the top speed in the various gears, not the pulling power of the engine on hills or heavy going."

**Centrifugal Types
Do Not Cut Power**
**by C. K.
McCullough**
Pierce Governor Co.

"There is a certain amount of animosity among operators toward governors because of possibly some previous experience where horsepower was affected, but it is our opinion, substantiated by many exhaustive tests, that centrifugal governors, properly made, properly installed, and properly set do not materially affect horsepower. We have installed engine speed centrifugal governors where the regulation between complete load and complete no-load has varied as little

Corner

Cut Peak

Operating Efficiency?

as 20 rpm, and you can readily see from this that no appreciable effect would be noted on horsepower. The dynamometer tests show under these conditions that the engine is pulling its full rated power without any interference whatsoever from the governor.

"The above comments do not hold true in regard to the so-called velocity of vacuum types of governors, of which we have built considerable numbers, for the simple reason that general practice dictates that the valve must be placed in somewhat of an angle to the air stream in order for the air, which is the prime mover, to impinge on the valve and therefore cause it to start closing. This, in itself, causes some restriction and some attendant loss of power.

"Further, as this class of governor starts to travel, at the governed point the valve tends to move slowly at first and restricts the opening and offers additional horsepower loss. Upon complete throttling at the governed point the valves usually tend to open slowly after a rather noticeable loss of power.

"It has been our general reaction that the operators' comments on this class of control equipment are quite right and that horsepower losses will range from 5 per cent on up to as high as 20 per cent depending upon the speed and the efficiency of the governing medium being used.

"None of the above comments apply to the straight centrifugal governor, either road speed or engine speed, as their valves are completely out of the air stream and inoperative up to the approximate point of governing."

They Cut Possibly Two Horsepower

by **W. J. Potter**
Service Manager
King-Seeley Corp.

"The application of a governor on an engine in peak operating condition, results in the loss of effective horsepower not to exceed two horsepower and sometimes, incidental to the characteristics of the governor and engine, less than that.

"To this extent, the application of governors sacrifices horsepower, but in evaluating this sacrifice, it should be kept in mind that the various accessories on the engine, all of them, require more horsepower than this amount. Such accessories as the fan, generator, water pump, air cleaner (incidentally, this horsepower loss is one of the problems in the development of air



cleaner design) and that, furthermore, engine condition as to bearings, valve lashing, timing, varnishing, et cetera, can cause a far greater sacrifice of horsepower than a governor application. Such things as defective steering, wheel balance, tire inflation, brake adjustment, also are reflected in far greater losses in horsepower than the governor application.

"The problem as expressed by fleet operators and drivers, we believe, is engendered by a resentment to any sort of control. The classic argument used by them, is that they cannot 'pull certain hills,' after a governor is installed, that they could pull in high gear prior to governor installation. We have investigated such complaints a number of times and have always found that such claims were based on excessive speed, known as 'running the hills' downhill in advance of a climb so as to acquire sufficient momentum to roll over the next hill without the necessity of shifting down through the gears. This excessive speed is injurious to the engine, dangerous to the equipment and constitutes a major reason why vehicle owners and maintenance superintendents employ governors, in that they prevent overspeeding beyond the recommended maximum engine speed set by engine manufacturers."

A Review of Several Types

by **Robert H. Thorner**

Sales Engineer
Mallory Electric Corp.

"Experience has proven that engine governors can be extremely valuable to fleet owners in reducing maintenance and accident costs. However, the advantage of engine governors cannot be realized unless the fleet operator understands the requirements of governors in general, as well

as the two basic classes of governors now being manufactured to meet these requirements.

(TURN TO PAGE 136, PLEASE)



Left. Company filling station, at El Paso shop provides centralized record control for home-based fleet

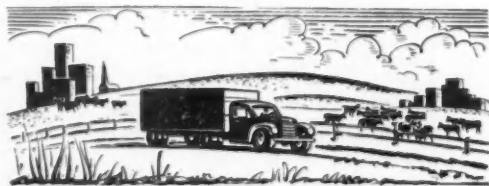
Below. Timing light is used regularly as part of 7-point PM program



O. P. Bond



Scattered Dairy Maintenance



116-vehicle fleet with well-equipped central shop and excellent PM program finds farmed-out service best for branches, own repairs most economical for home-based vehicles

by O. P. BOND

Superintendent of Transportation
Prices Creameries, Inc., El Paso, Texas

WITH seven branches, and approximately one third of our fleet operating out of these branches only, our biggest maintenance problem is that of deciding what work is to be handled in our headquarters shop and what is to be farmed out. How it is to be farmed out, making the right contacts on this branch work, and keeping reliable unit records on branch units are corollary headaches.

There are 116 units in our over-all fleet. Our main headquarters and shop at El Paso, Texas, handle the operation and service of 70 units. Our seven branches, located from 40 to 200 miles from headquarters, are all in New Mexico: Roswell with 15 units; Portales with 10; Hobbs with 4; Carlsbad with 4; Las Cruces with 6; Hot Springs with 3; and Deming with 4.

A vehicle breakdown shows that 10 of the units are semi-trailers with tractors; 50 are 1½-ton, special-body wholesale trucks; 25 are ½-ton retail trucks; 16 are farm-to-branch, stake-body, 1½-ton pickups; and 15 are special-type, ¾-ton city delivery

Right. Maintenance record form (8½ x 11 in.) gives all basic data as well as mechanical history of each truck

Below. Mechanic checks distributor with dwell angle tester and tachometer



Form #29							
MAINTENANCE RECORD							
CO. NO.	MAKE & YR.	MODEL	SERIAL NO.	ENGINE NO.	BODY TYPE	CAP'Y.	WEIGHT
Cyl. Sizes		Rod Sizes		Main Sizes		B.Drum Sizes	
Dist. Make		No.		Carb. Make		No.	
Gen. "		No.		Fuel Pump "		No.	
Volt.Reg. "		No.		Aux.Brakes "		No.	
Starter "		No.		Aux.Trans. "		No.	
Trans. "		No.		Aux. Axle "		No.	
Oil Filter "		No.					
DATE SPEEDO. OPERA				DETAILS			

trucks used in El Paso, Texas, only.

The garage and repair shop at El Paso headquarters is kept open and operating 24 hours a day. Here we have one foreman, two master mechanics, one lubrication man and steam cleaner, one painter, and two night wash and grease men.

Branch Work Farmed-Out

WE make three regular inspection trips a year to all the branches, spending sufficient time at each to make full inspection on all units. The branch manager and the truck driver form the team at each branch which is responsible for the individual unit.

At the time of the inspections we decide what work is needed in the way of minor and major overhauls. Fully 90 per cent of this is farmed out and the contract for the work made while the headquarter's shop foreman is at the branch. The truck to be repaired is taken in to the independent shop and, with the manager, driver and myself, the whole layout is checked, an estimate on the

work obtained, and the work contracted.

A report is made up and brought back to the El Paso office. After the work has been completed and the statement presented, this is checked with the examination-contract report before the bill is paid.

For repair needs between inspection trip dates, the branch manager and the driver take the unit to an approved repair shop.

On all units which are to be retired from branch use, or are to be traded in, the truck is brought to the El Paso headquarters and an exchange made. However this accounts for only a small percentage of the units repaired from branches.

Comparative Costs

SHOP work vs. farmed-out work is also a tough nut to crack at headquarters. At present we do all repair and handle all major and minor rebuilding except body work and tire work.

Formerly we farmed out all of our reboring work. We bought a reborer

for the shop at a cost of \$355 and set it up on a ten-year depreciation rate—\$35.50 per year charged off.

Today we do all of our own reboring. On the average six cylinder job we rebore 6 cylinders in less than four hours at a cost to us (except for depreciation charge) of between \$5 and \$6. When we farmed out this work it cost us \$2 per hole, or \$12 for the block. This charge has been raised now to \$2.50, or a total of \$15.

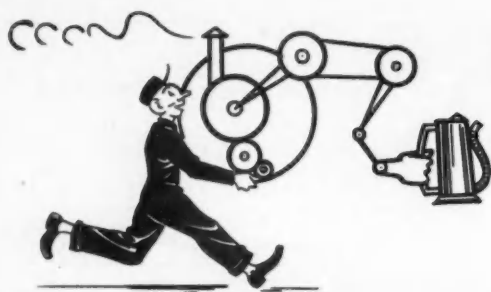
Here is a unit savings of between \$9 and \$10 and we do 30 jobs per year, meaning a savings of \$250 per year (with equipment depreciation figured in at \$35.50 per year). Besides the savings, we get the work done when we need it and we know that the job is right. And our own rebore jobs have been standing up better than the former farmed out work.

Before the war we did our own body work. This was discontinued during the war. Our war-time experience was such that we have decided on a farmed-out program for all body work from now on. A body man who can handle all of our work can make \$5 per hour. With our fleet total we cannot afford to keep a full time body man. Nor can we afford second rate body work when good work is needed.

Rigid Tune-Up

THE 70 units which are serviced out of our El Paso headquarters receive a complete motor tune-up on the average of each four months. We expect our master mechanic assigned to the unit to spend an average of

(TURN TO PAGE 118, PLEASE)



\$ 25

**For the Best Hint
Published Each Month**

\$ 5

**For All
Hints Published**

1. Hub Puller

by Lewis Condon
Rainbow Bread Co.
Brookfield, Mo.

Here is a puller we have made to remove truck rear hubs (full floating) when bearings have become damaged and frozen. This type of tool has been in use in our shops for ten years and will do any job.

Dimensions will depend on the size of the hub and the axle housing. The puller is made from three parts. A flanged thrust plug slips inside the end of the housing with flange bearing against end of housing. A threaded plate is drilled and bolted to the hub at the axle studs. A threaded shaft screws through the plate to exert pressure on the thrust plug.

Any shop can make up a tool of this type at little expense.

2. Wheel Carrier

by Robert L. Moore
Major, Ordnance Dept.

Here really is a "Giz-Mo" for removing and carrying heavy truck wheels. The device is simply an adjustable jack mounted on four wheels or casters. Four metal uprights of angle iron 3 ft. long are bolted to the axles and are brought to a common point, where either a rigid or a bumper jack is welded on.

A piece of angle iron is welded to the jack and fashioned so it will fit into the end of the axle tube. Thus the carrier can be wheeled to the truck, the projecting arm adjusted to the height of the axle tube and the wheel slid onto the arm. No handling is necessary, and the carrier can be used to wheel the assembly anywhere about the shop.

3. Hydraulic Press

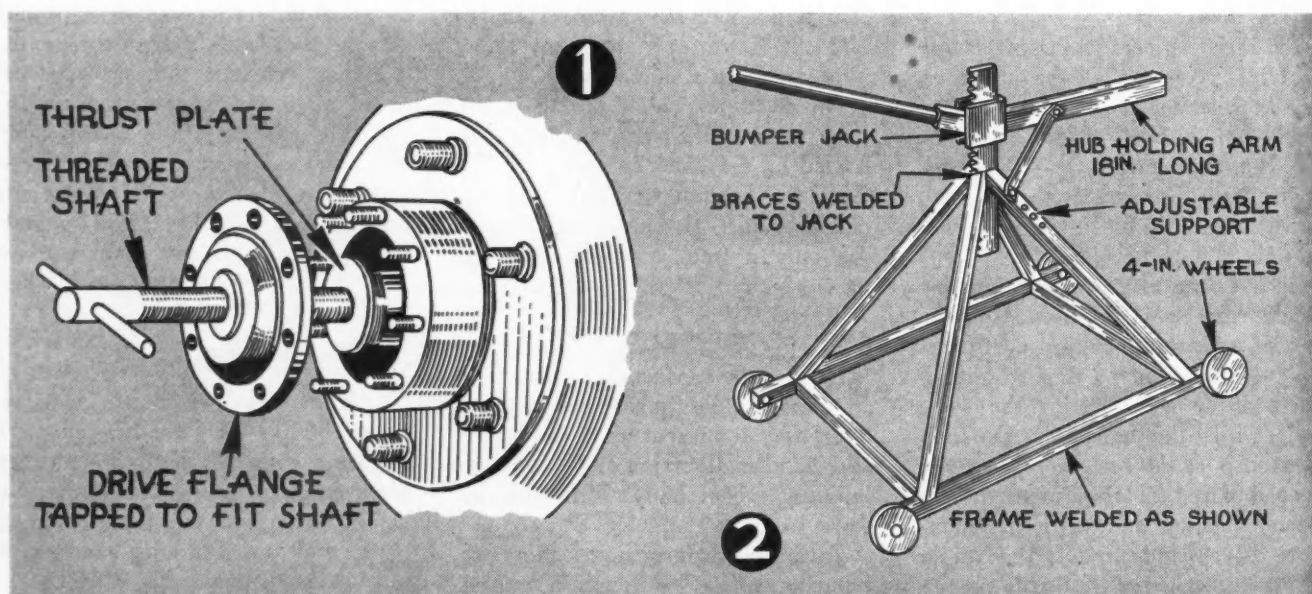
by F. W. Green
Machine and Repair Shop
Oshkosh, Wis.

A home-made hydraulic press can be made from an old truck frame or the ends of a frame that has been left over when shortening wheelbase. A regular hydraulic jack is mounted on a cross piece as shown. This cross piece, as well as the one above, is fastened to the frame with removable bolts so that it can be readily adjusted to the work. Dimensions will vary with the work requirements.

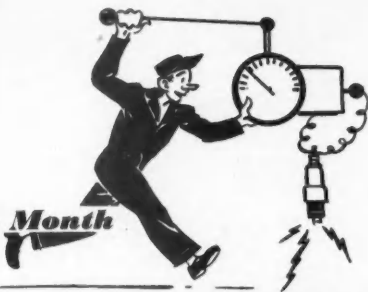
4. Tire Chain Tip

by Robert S. Orr
Manufacturers' Light and
Power Co.
Brownsville, Pa.

To prevent tire chains from tearing emergency brake cables off Chevrolet 1½ ton trucks, I make a spacer and



Each Month



SHOP HINTS

FROM FLEET SHOPS

insert it between the backing plate and brake cable flange.

These spacers may be made of hard wood or iron. I have put as much as a $1\frac{1}{4}$ in. spacer in and have averted this common trouble.

5. Fifth Wheel Ground

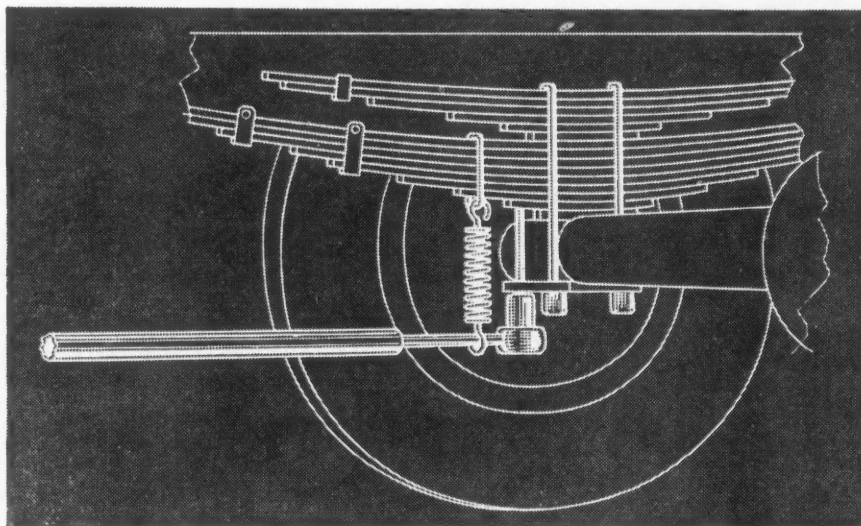
by Frank E. Seftchick
Swift & Co., Brooklyn, N. Y.

A long battery ground strap makes an excellent ground between the fifth wheel and tractor. It can be attached anywhere out of the way but must be long enough to allow for movement of the fifth wheel.

6. Head Lifting Fixture

by W. M. Kendrick
Acme Laundry Co.,
Chatham, Mass.

When removing or replacing Chevrolet cylinder heads, this fixture makes the job much easier,

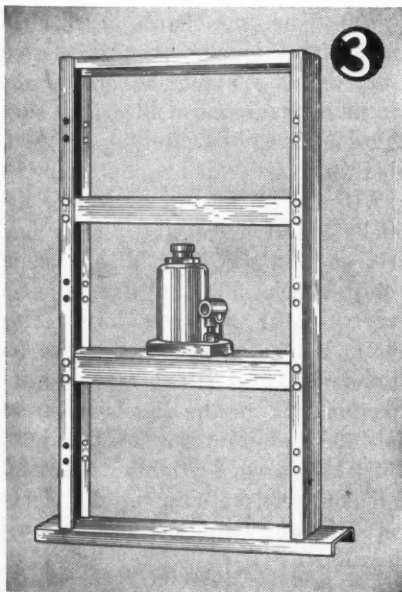


U-Bolt Wrench Guide

by Joe H. Ragan
East Tenn. Packing Co.
Knoxville, Tenn.

Enclosed is a sketch of a handy wrench holder to be used when U-bolts are tightened.

A common coil spring is equipped with wire hooks so it can be suspended from the leaf spring and hooked to the wrench handle, thus leaving the mechanic's hands free for pulling on the wrench. The guide holds the wrench to the nut and saves a lot of time and trouble in this job.



especially on C-O-E model trucks.

Take a piece of 2 x 4, 18 in. long and bore a $\frac{3}{8}$ -in. hole $2\frac{5}{8}$ -in. from each end. Remove the rocker arm shaft and push the 2 x 4 over the long studs and bolt securely. This makes a handy handle with which you can roll, lift or tilt the head as required without damaging the gasket.

7. Regulator Tool

by R. M. Shelton
Safety Convoy Co., Dallas, Tex.

A handy bending tool for setting Ford voltage regulators can be made from a Ford oil gage stick. Saw out a slot with a hacksaw to the required

(TURN TO NEXT PAGE, PLEASE)

SHOP HINTS . . .

(Continued from page 45)

dimension to fit the spring tension arm and bend the handle to any convenient shape.

8. Wiper Tip

by Tim Vahle
Iowa Ordnance Plant
Burlington, Iowa

We have experienced the inconvenience of inoperative windshield wipers when going up hill or with wide-open throttle and have devised a system to eliminate this.

I simply cut a T into any convenient place between the vacuum tank and the check valve and connect the wiper hose to this T. All our trucks with vacuum booster brakes or hydrovacs have been changed in this manner; it takes less than 1/2 hour and will insure proper wiper action at all times.

9. Spare Tire Rack

by Jean Babin, Shop Supt.
Columbian Laundry,
Newark, N. J.

We find that the tire rack on our 1 1/2-ton trucks is in an unsatisfactory location because the bolts become rusted, drivers fail to keep the spare inflated and they get dirty when changing a tire.

As a result we have made a tire rack and located it inside the panel body.

A 2-in. strap iron plate 24 in. long is drilled to take three lag screws or metal screws to secure it to the body. One half in. bolts 10 in. long are welded or bolted through this plate and fitted with wing nuts. These are spaced so that they meet the holes in the wheel. The tire is rested on the floor and tightened in place. Now the spare is always clean and ready for instant use. If space does not permit this location, it can be just as well raised to any height desired.

10. Battery Charger

by T. J. Hourihan
Moulten & Holmes, Boston, Mass.

Here is a shop hint I have found very useful. We have a small battery

charger which we use to charge the batteries without removing them from the vehicles. It is a slow charger, and we have rigged up a timer so we can shut up shop at night and leave it on. The automatic shut-off will stop the charger at the time designated.

I purchased a conventional time switch at a cost of \$6.80. I wired this with a receptacle and plug so that the clock can be set to shut off the charging. Now the shop can be closed while the battery is being charged.

11. Air Brake Tip

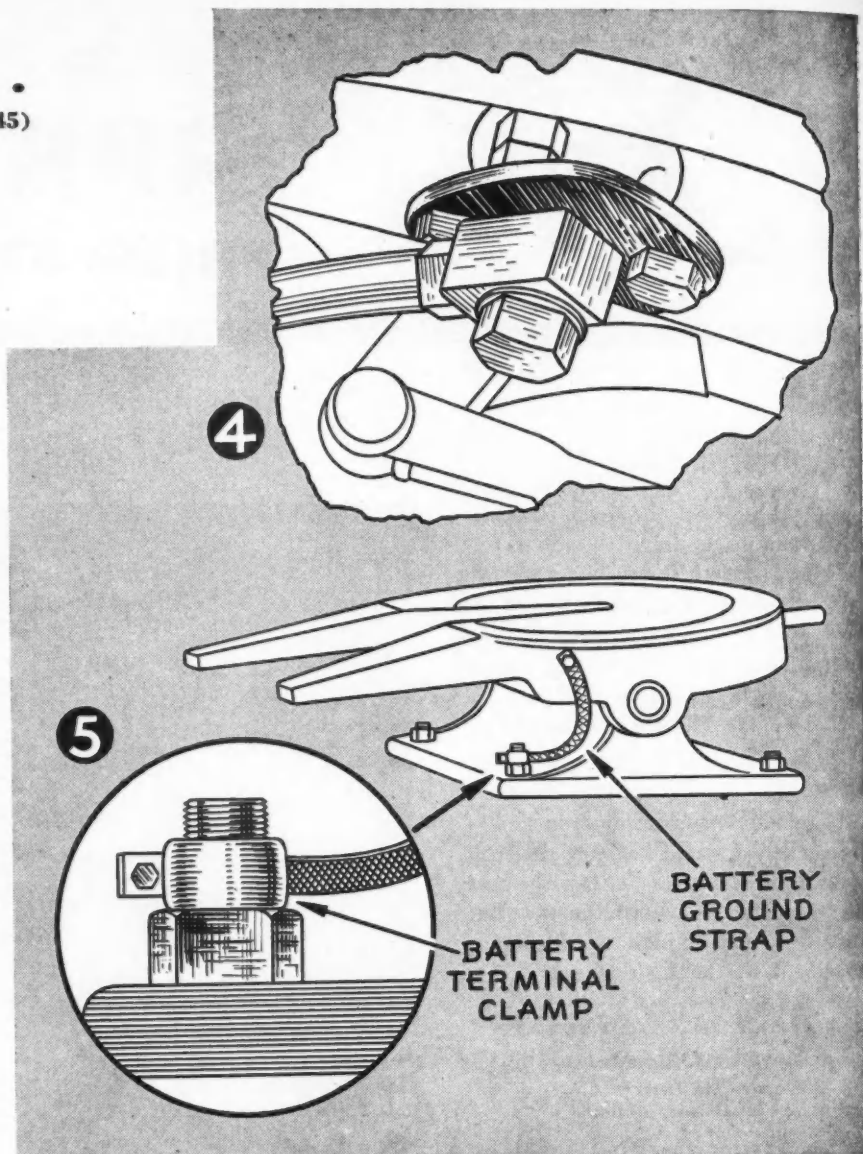
by Luther Noe
Hageman Transport Co.
Laurel, Mont.

Having had considerable trouble with our air compressors pumping oil

and depositing it in reservoirs, we have developed a scheme for eliminating this condition.

We knew the condition resulted from dirty air filters, so we started from there. We remove one of the air intake caps and drill a hole suitable for either 5/8-in. tubing or 3/8-in. pipe which is welded to the cap.

We remove the top section of the intake manifold on the diesels and drill and tap the 3/8-in. pipe, placing a 4-in. nipple in it, and then connect the two with a heater hose. This allows the compressor to secure an abundance of air clean from the intake manifold on the diesels and from the intake pipe on the gasoline jobs. This has proved highly successful and completely eliminates the cleaning of our air compressor air cleaners.





The OVERLOAD

For the Record: New Records . . . GVW Rating Progress . . . Kingpin-Offset Benefits

by **GEORGE T. HOOK**

Editor

THE phenomenal total of 1,219,446 motor trucks were manufactured in the United States in 1947. This is a new record. The previous high was in 1941 when 1,094,000 trucks were produced.

* * *

U. S. truck operators bought up their share of this production as fast as it became available, but there is nothing phenomenal in this fact. It was to be expected. Truck users are hungry for more of the same. In fact they are hungry for some models that are conspicuously in short supply, viz and to wit: sedan and panel deliveries. But since such models use up as much or more steel than goes into a more profitable passenger car, it will be some time before the big mass producers find it good business to divert sheet steel to the light commercial models.

* * *

When the new truck registration figures for 1947 are in they will show that about 890,000 trucks were bought and registered. This, too, is a new record. It compares with the previous high of 640,697 in 1941.

* * *

Although there continues to be a shortage of some parts for some truck models that are 10 or more years old, the overall replacement parts situation is much improved. The reason for this is another record-breaking output of parts. The 1947 dollar volume of parts will be at least \$2¼ billions, as compared with \$1¾ billions in 1946, the previous peak year, and approximately \$¾ billion in 1941.

* * *

And what of the year 1948? Truck manufacturers are ready to produce another 1¼ million trucks. Truck users are ready to buy as many and more than in 1947. But not until Congress determines upon the extent of U. S. aid to Europe can the situation with regard to materials be gaged.

At the moment it looks as if truck production would be as great in 1948 as in 1947. Also that domestically the various sizes of trucks will be available to the same extent as this year.

* * *

AUTOMOTIVE progress is made in stages. Bill Stout once contended that this could not be true of engine position, that the engine can't be moved gradually from the front of a car to the rear. Literally true. But so far as public consciousness is concerned it can be done in stages. It is being done with the currently popular styling. The "new look" is so much alike front and rear, that eventually the engine can be switched from fore to aft without the public's being aware—appearance-wise—of a revolutionary change.

* * *

Another example of progress in stages is the truck industry's conversion from tonnage to gross vehicle weight ratings. It is almost 20 years since this publication denounced the practice of tonnage-rating trucks by pulling numbers out of hats, and advocated gross vehicle weight as the only sound rating method. Tonnages were removed thereafter from the CCJ Truck Specifications Table and GVW substituted. Manufacturers went along. So have many states. Some operators have resisted it in states for fear of upsetting registration fee setups.

* * *

"In 1941 the American Association of Motor Vehicle Administrators recommended the universal adoption of gross vehicle weight for registering and licensing purposes. And as of Jan. 1 most truck manufacturers have been attaching identification plates to new trucks containing the GVW and net HP ratings. The next stage is for 23 states (10 of which use net weight and 13 of which use tare weight) to join the 26 that use gross vehicle weight rating.

CONSIDERING all the advantages that accrue when the kingpin on a tractor-semitrailer is set a proper distance ahead of the tractor rear axle, it is amazing why the practice is not insisted upon by truck operators.

* * *

The attitude of drivers is, of course, one reason for operator inertia. Drivers don't like rigs that steer hard and that is their complaint when the kingpin is offset. There have been some operators who have been compelled to change kingpins from the offset position because of driver reaction. And back of the driver there is always the union. It becomes expedient to "compromise" when there is danger of disturbing labor relations.

* * *

But the foremost reason for operator inertia is, to put it baldly, ignorance. Top management has not been aware of the advantages of kingpin offset, and even many fleet engineers, on whom top management depends for sound transportation engineering advice, have not kept themselves properly informed.

* * *

Articles on the subject have been published before, and a new one—thorough in its approach to the subject—is published in this issue. It discusses the effect of kingpin offset on load distribution, traction, braking, steering, turning radius, maneuvering and riding. The advantages are all with kingpin offset.

* * *

The article should be read and absorbed by every fleet owner and every executive who has anything to do with the selection and purchase of vehicles. It should be used as a document to convert drivers and their representatives to a realization that the ease with which a vehicle is steered cannot take precedence over factors that have a direct bearing on safe and economical operation.



TOLL ROADS

Fleets Should Oppose Them

Because: 1. They offer only a temporary, not a permanent solution to highway congestion.

2. They require double taxation—the highway user already pays for adequate roads through vehicle taxes.

3. They intensify problems on paralleling roads because the free roads, which must continue to bear the bulk of the traffic, cannot be improved too much without impairing the toll road's financial success.

4. Only in rare instances can a toll road expect to pay off its indebtedness. If it fails, the state has to assume a bonded indebtedness bearing high interest rate, and highway users will have to pay the bill.

5. Toll roads may prevent completion of the great free interstate highways program of the Federal and state governments.



by **ARTHUR C. BUTLER**

Director National Highway Users Conference

AT ABOUT the time you read this, legislatures of eight states will be beginning regular sessions. Highway legislation always makes up a heavy percentage of their lawmaking tasks. In dealing with highway prob-

lems, some of these legislators will see potent magic in the words "toll roads."

That was the experience last year, anyway, when lawmakers of seven states enacted toll road legislation. In at least some of these cases, tolls were regarded as the easy answer to admittedly tough highway and highway finance problems.

The surface attraction of toll-road

proposals, therefore, needs to be combatted again this year by highway users, or we will again be buying, piecemeal, a very runty pig in a very expensive—and expensive—poke.

States which have particular stretches of road calling for drastic improvement always find this mysterious pig-in-poke bargain waved alluringly under their noses very early in proceedings. If there is an unpleasant odor emanating from the bag, there is also the seductive perfume known as "Something for Nothing," with which the sack has been liberally anointed.

This perfume may in some cases be applied by investment firms, eager to handle toll-road bond issues.

Under the heady influence of this perfume, legislators and even governors sometimes come to believe that \$100 million highways can be built absolutely for nothing, and that the \$100 million can then be spent for something else.

This being the case, let us peek into the toll-road poke and examine the less fragrant contents.

Only Temporary Solution

IN the first place, the toll road offers only a temporary, not a permanent, solution to highway congestion. While the toll road can expedite the movements of some traffic, it can never attract the bulk of vehicles—most vehicles are debarred from use because most of their trips are "local," not of turnpike length. This being the case, turnpikes cannot eliminate the necessity for good free parallel highways.

But when toll roads are built, immediate prospects for states improving these paralleling free highways sink swiftly. States with toll roads would naturally be loath to improve free roads to standards which would hurt their turnpike's revenues. So instead of helping to ease congestion on free roads, turnpikes may help to perpetuate it.

Not Something for Nothing

IN the second place, the toll roads are not giving something for nothing. The people who use them are victims of double taxation—while paying tolls they are also paying all the regular highway-user taxes. This is an especially important consideration to those whose highway costs

(TURN TO PAGE 107, PLEASE)



Fleets Rely on Own Experience for OIL CHANGE PERIODS

Schedules best suited to operating conditions are employed by 33.96%; next most frequently mentioned factor is mileage tie-in with maintenance

Analysis by A. W. GREENE, Managing Editor, Commercial Car Journal

THE NATION'S TOP FLEETS rely upon their own experience, more than any other factor, when it comes to deciding on oil change periods for their vehicles. Of the 10 factors listed by the Board of Experts, 33.96 per cent work on an experience basis. Predetermined mileage schedules and oil discoloration are the next two most frequently mentioned factors. As shown in Table 1, 15.09 per cent work on a mileage basis, and 14.15 per cent change when the oil gets "dark."

Fleetmen who study this table carefully may wonder why 10 headings were set up when, actually, there are but four major factors indicated. Therefore, it is necessary to point out that the studies comprising the Fleet Operators' Experience Handbook are based on actual statements made by members of COMMERCIAL CAR JOURNAL's Board of Experts. All information obtained is tabulated, as exactly as possible, as stated in the surveys. Of course,

inasmuch as space limitations make it impossible to quote each member of the Board verbatim, a certain amount of interpretation is necessary. This, however, is reduced to the minimum. Thus, while the term "experience" implies experimentation with mileage intervals, time intervals (such as weeks or months), outside advice or personal findings from periodic inspections—or any combination of these factors—the heading Experience was set up because the term was either actually used or implied in the individual reports. "Our experience shows this oil change period is best suited to our operation," is a typical quotation of fleetmen tabulated in this group. A typical comment of the fleetmen whose comments are tabulated in the Mileage column is, "We decided on this mileage because it fits our maintenance schedules, which are based on mileage." (TURN TO NEXT PAGE, PLEASE)

Leading Factors Responsible for Engine Oil Change Schedules 33% work on experience schedules, 15% use mileage as a guide, 14% watch color

Table 1

VOCATIONAL GROUPS	Number of Fleets Reporting	Experience	Mileage	Color	Advice of Oil Testing Laboratory	Truck Manufacturer Recommendation	Inspection	Type of Work Being Done	Time Basis (hrs, days, wks, mos)	Process of Elimination	Contamination	Not Reporting Reasons
		Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent	Per Cent
COMMON CARRIER GROUP												
Local and Over-the-Road.....	40	55.00	.....	12.50	20.00	2.50	5.00	.....	.....	2.50	.....	2.50
FOOD DISTRIBUTION GROUP												
Bakeries, Dairies, Meats and Other Food Products.....	36	22.22	22.22	22.22	13.89	2.78	5.56	2.78	2.78	.....	2.78	2.78
GOVERNMENT GROUP												
State, County, Municipal, Federal.....	59	40.68	22.03	8.47	1.69	6.78	1.69	3.39	1.69	.....	3.39	11.86
CONSTRUCTION GROUP												
Builders, Quarries, Gravel.....	5	.....	20.00	20.00	20.00	40.00	.....	.....	.....	.....	.....	20.00
INDUSTRIAL GROUP												
Local and Over-the-Road.....	2	50.00	.....	50.00	.....	50.00	.....	.....	.....	.....	.....	.....
PETROLEUM GROUP												
Producers and Distributors.....	9	55.56	33.33	.....	.....	.....	.....	.....	.....	.....	.....	11.11
PUBLIC UTILITY GROUP												
Gas, Power, Water and Telephone.....	32	21.88	15.63	15.63	9.38	6.25	15.63	9.38	.....	6.25	3.13	3.13
RETAIL DELIVERY GROUP												
(Other than Food) Dry Cleaning, Laundry, Newspaper, Coal and Ice, Department Stores, Beverage....	15	20.00	.....	20.00	13.33	.....	13.33	.....	20.00	6.67	.....	26.67
TRUCK RENTAL GROUP	5	20.00	20.00	20.00	.....	40.00	.....	.....	.....	.....	.....	.....
TRUCK AND BUS FLEETS, MIXED....	9	11.11	11.11	11.11	44.44	.....	11.11	.....	.....	11.11	.....	.....
TOTALS AND AVERAGE.....	212	33.96	15.09	14.15	11.32	6.13	6.13	2.83	2.36	2.36	1.89	7.55

LUBRICATION

Average Engine Oil Change Frequency is Approximately 2000 Miles

Light trucks average 2000 miles between changes, medium 1900, and heavies 2200

Table 2

VOCATIONAL GROUPS	Number of Fleets Reporting	LIGHT TRUCKS				MEDIUM TRUCKS				HEAVY TRUCKS				PASSENGER CARS			
		MILES		Weeks	Months	MILES		Weeks	Months	MILES		Weeks	Months	MILES		Weeks	Months
		Range in Thousands of Miles	Average in Thousands of Miles			Range in Thousands of Miles	Average in Thousands of Miles			Range in Thousands of Miles	Average in Thousands of Miles			Range in Thousands of Miles	Average in Thousands of Miles		
COMMON CARRIER Local and Over-the-Road....	40	1-6	1.9	2	1	1-6	2.2	1.5	1	1-7	2.5	1.5	.....	1-6	2.1	2	1
FOOD DISTRIBUTION Bakeries, Dairies, Meats and Other Food Products.....	36	1-3	1.6	2	3.6	.8-3	1.5	2	2.8	1-6	1.9	1.5	4.1	1-6	2.0	2	4.2
GOVERNMENT State, County, Municipal, Federal.....	59	.5-6	1.5	1.6	1.5	.5-6	1.4	1	1.5	.5-6	1.3	1	1.5	.7-6	1.5	1	1.5
CONSTRUCTION Builders, Quarries, Gravel....	5	1-5	2.0	.....	.....	1-2	1.6	1	.....	1-2.5	1.8	1	.....	1-2	1.2	.....	.....
INDUSTRIAL Local and Over-the-Road....	2	2-5	3.5	.....	.....	2-5	3.5	.....	.....	2-5	3.5	.....	.....	2-3	2.5	.....	.....
PETROLEUM Producers and Distributors....	9	1-2	1.2	.....	.....	1-5	1.0	1	.....	.8-3	1.2	1	.....	1-2	1.3	.....	1
PUBLIC UTILITY Gas, Power, Water and Telephone.....	32	.5-10	2.8	6	3.7	.5-10	2.8	6	3.8	.5-10	2.7	6	2.7	.5-10	3.0	.....	3.3
RETAIL DELIVERY (Other than Food) Dry Clean- ing, Laundry, Newspaper, Coal and Ice, Department Stores, Beverage.....	15	1-4	2.0	1	2.1	1-3	1.4	1	.....	1-4	2.5	3.5	3	1-5	2.4	1	2
TRUCK RENTAL TRUCK AND BUS FLEETS, MIXED.....	5	1-2	1.4	.....	.....	1-2	1.2	.....	.....	1-2	1.3	.....	.....	1-1.2	1.2	.....	.....
	9	2-2.5	2.1	.....	.....	2-2.5	2.1	.....	.....	2-6	3.1	.....	.....	1-2.5	1.9	.....	.....
TOTAL AND AVERAGE.....	212	.5-10	2.0	2.5	2.4	.5-10	1.9	1.9	2.3	.5-10	2.2	2.2	2.6	.5-10	1.9	1.5	2.1

"When the oil gets dark, we change it," is approximately the wording of the comments grouped in the Color column.

The next two columns are quite clear. The column headed Inspection, however, seems to require explanation. While the inference seems to be the same as that in the Color column, a separate listing was made because so many fleetmen used that term. The same is true of the comments in the Contamination column; although here some of the remarks imply the use of methods to detect dilution by gasoline, presence of water, sludge and acidity.

In the Type of Work column, the comments imply flexible schedules. "It all depends on the type of work that the truck is

doing," says one fleet operator. "In local service we work on a mileage schedule, and, in over-the-road service, the same truck would be placed on a weekly schedule."

Time basis mainly refers to weekly and monthly periods. Hours, however, also were mentioned by quite a few, especially those having vehicles on off-the-road work.

Process of Elimination comments probably could be grouped under the Experience column but, inasmuch as an appreciable number of fleetmen used that term, it was considered more accurate reporting to set up a column with this heading.

Due to the fact that some fleetmen mentioned more than one basis for the adoption of their oil change periods, the per cent totals for some of the vocational groups add up to more than 100 per cent.

Disposition of Drained Oil

Majority, 70%, discard crankcase drainings

21% sell and balance reclaim used engine oil

Table 3

VOCATIONAL GROUPS	Number of Fleets Reporting	Throw Away	Sell	Reclaim
		Per Cent	Per Cent	Per Cent
COMMON CARRIER GROUP Local and Over-the-Road.....	42	59.52	35.72	4.76
FOOD DISTRIBUTION GROUP Bakeries, Dairies, Meats and Other Food Products.....	43	65.12	25.58	9.30
GOVERNMENT GROUP State, County, Municipal, Federal.....	53	66.79	7.55	5.66
CONSTRUCTION GROUP Builders, Quarries, Gravel.....	5	80.00	20.00	.....
INDUSTRIAL GROUP Local and Over-the-Road.....	1	100.00	.....	.....
PETROLEUM GROUP Producers and Distributors.....	8	62.50	25.00	12.50
PUBLIC UTILITY GROUP Gas, Power, Water and Telephone.....	30	70.00	13.33	16.67
RETAIL DELIVERY GROUP (Other than Food) Dry Cleaning, Laundry, Newspaper, Coal and Ice, Department Stores, Beverage....	16	66.75	25.00	6.25
TRUCK RENTAL GROUP.....	5	60.00	40.00	.....
TRUCK AND BUS FLEETS, MIXED.....	7	57.14	28.57	14.29
TOTAL AND AVERAGE.....	210	70.48	21.43	8.09

Oil Change Frequency Schedules

A TABULATION of the oil change frequency schedules reported by the Board of Experts will be found in Table 2. The national average for fleets that work on a mileage basis is 2000 for light trucks, 1900 miles for medium trucks, 2200 miles for heavy trucks and 1900 miles for passenger cars. Because the variation in the mileage schedules is rather large in quite a few cases, an extra column was added in the table to show the extremes. Some public utility fleets, for example, change as frequently as every 500 miles, while others work on 10,000-mile schedules. The extremes in weekly and monthly schedules were too inconsequential to tabulate.

Comparison of Table 2 with Table 1 may seem to show discrepancies that require explanation. The Time Basis column in Table 1, for example, does not show any Common Carrier fleets using that basis. Yet, in Table 2, time intervals are reported. Actually, the fleets in the Common Carrier Group reporting the use of time schedules are distributed under such headings as Experience, Advice of Oil Testing Laboratory, Inspection, and Process of Elimination.

What fleets are doing with their used crankcase oil is shown in Table 3. The trend, based on pre-war practice, is in the direction of reclaiming or selling. Current petroleum products delivery shortages may further cut down the Throw Away percentage.



CORRECT Application of Motor Trucks

Eight vital steps in the selection of the right vehicle for specific service requirements and economical operation

STEP 8 (CONCLUSION)

How to Select Other Equipment

Choosing the Correct Chassis Springs . . . Method of Calculating the Actual Spring Loads . . . Choosing the Correct Service Brakes . . . How to Determine the Size or Capacity of a Generator and a Battery . . . Method of Figuring Total Continuous Electrical Load

(Copyright 1947, The White Motor Co., Cleveland, Ohio)

CORRECT APPLICATION at its best includes nearly every unit of a truck. Not just the major units discussed in the other steps, but small units as well—the generator, brakes, springs, etc. There are a number of such small units which are available in more than one type to meet the needs of various operating problems. The correct selection of these units is part of the application solution since such equipment affects safety and control of the truck, as well as efficiency of operation. These small details then are important. They are the finesse in correct application that rounds out the selection of a truck. The total choice is a truck applied, in every possible unit, to the requirements of the trucking operation.

Choosing the Right Chassis Springs

ON EACH truck model, the chassis standard springs are designed with a capacity for a definite load, and a certain amount of deflection from light to the fully loaded position. The capacity of these standard springs was designed on the basis of the average weight distribution and a normal maximum load for the truck model. Most truck manufacturers' specifications will list the capacities for these standard springs, and optional springs which are available.

A part of correct application should include a check on: (1) The actual spring loads of the truck, against (2) the capacities in the specifications, to determine the springs best suited to the job.

This check is made by finding the spring load, like this: Sub-

tract the weight of axles with wheels, tires, and springs from the front and rear gross vehicle weights, which have already been determined in the analysis of the truck weight distribution (Step 3, Page 15). The result is the total weight on the springs.

For example, a truck with a gross weight of 24,000 lb. and a distribution of 27 per cent of the weight on the front axle would figure out as follows:

CALCULATING THE ACTUAL SPRING LOADS

	Front	Rear
Total gross vehicle weight.....	6,500 lb.	17,500 lb.
Weight of axles with wheels, tires, and springs.....	950 lb.	3,200 lb.
Total weight on springs.....	5,550 lb.	14,300 lb.
TOTAL WEIGHT EACH SPRING.....	2,775 lb.	7,150 lb.

The figures on the total weight on each spring, front and rear, should be compared with the weights listed in the truck manufacturer's specifications. Of the available standard or optional springs, the ones closest in capacity to these figures should be used.

Also among the spring data in the manufacturer's specifications is information on the *rate*—rate of deflection in pounds per inch. This rate figure is sometimes necessary to truck application since it affects not only the riding qualities of the truck, but also the height of the chassis frame and the amount of the difference in chassis height between light and fully loaded positions. The

CORRECT Application of Motor Trucks

higher the rate, the stiffer the springs. So that springs with a high rate show a smaller difference in chassis height between lightly loaded and fully loaded frames.

This rate also affects the position of the truck body and chassis on the wheels. Sometimes the type of body mounting, or the operation of equipment on the vehicle, requires the chassis frame to be level under certain loaded conditions. Some attention will have to be paid to the spring's rate of deflection in order to achieve this.

Application of tractors used to pull semi-trailers brings up several problems regarding springs. On some tractors the fifth wheel must be an exact height from the ground. And the springs must have a definitely limited amount of deflection. This is necessary so the tractor will be able to correctly pick up and drop the semi-trailer with various types of standard or automatic fifth wheels and jacks. At times, it is necessary to make special modifications of the tractor springs. The engineering branch of the truck manufacturer should be consulted regarding such special spring problems.

Rate of deflection is also of importance in special cases where it is necessary to control the body sway when turning corners and at other times. Springs selected in such applications should be stiffer or, in other words, have a higher rate of deflection than the standard springs.

Choosing the Right Service Brakes

TWO general types of brakes are available on most trucks—air-power-operated brakes and vacuum-power-operated brakes. The air power for operating the brakes is derived from an air compressor driven by the truck engine. The vacuum power for operating the brakes is taken either from the intake system or from a vacuum pump driven by the truck engine. Before the fleet owner completes the application of a truck, he should decide which type of brakes he prefers, and also which optional equipment is necessary to augment that type.

Air brake installations on normal tractor-trailer and straight trucks are complete and satisfactory. The standard air compressor furnishes the amount of air required.

In the case of larger units, such as large truck-train combinations, the standard compressor might be inadequate. There are sometimes as high as 12 or more air diaphragms to be supplied each time the brakes are applied—which is double the number on most truck units. An optional compressor of higher displacement, supplying a greater volume of compressed air, should be required—especially when the route includes hilly country and heavy traffic.

Vacuum-power-operated brake installations on normal tractor-trailers and straight trucks are also complete and satisfactory. The standard installation has the vacuum cylinder connected to the intake manifold which furnishes a high degree of vacuum and permits safe brake operation. Auxiliary vacuum reservoir tanks should always be used. Larger units such as truck-trains and others, may need additional vacuum to operate the brakes. Instead of depending on the intake manifold, vacuum pumps driven by the engine can be used to furnish the additional power.

Which type of brakes should the fleet operator choose when the truck model has both available? Both systems are designed to perform an efficient braking job and conform to standard braking requirements. The choice may be based mainly on interchangeability. Usually the brake system on which the fleet is standardized is the logical preference because of simplified parts problems and maintenance problems. However, in the case of multiple-axle truck-trains operating over long grades, the air-operated brakes are normally recommended instead of the vacuum-operated brakes. With air brakes the truck has a greater safety margin in brake operation under such circumstances.

Selecting the Electrical Equipment

MOST trucks have many items of electrical equipment which are available in several types and sizes for each model. There are several sizes of generators and batteries available. Or special low-cut-in generators. Or a 12-volt electrical system, instead of the more popular 6-volt system. Or other pieces of electrical equipment which vary with the truck model and the truck manufacturer.

The choice most buyers will face in the application of a truck is in the size of generator and battery. This size can be ascertained by first finding the total electrical load for the truck in this manner: The amperes of current required for each of the electrical devices which may be in continuous operation at one time are totaled. The ampere output of the generator should be approximately 10 per cent greater than this total continuous electrical load. For example, a large tractor-semi-trailer which operates at night would have the following electrical load:

DETERMINING THE TOTAL CONTINUOUS ELECTRICAL LOAD

UNIT: Tractor-Semi-Trailer	Amperes Each	Amperes Total
Headlights (2).....	7.50	15.00
Tailights (2).....	.56	1.12
Dashboard lights (7).....	.25	1.75
Ignition coil (1).....		2.00
Heater and ventilator blower (1).....		12.00
Cab marker lights (5).....	.56	2.80
Trailer marker and side lights (8).....	.56	4.48
TOTAL MINIMUM CONTINUOUS LOAD.....		39.15
In the case of a tractor using fog lights in wet weather, the above amount would be increased as follows:		
Fog lights (2).....	3.7	7.4
TOTAL CONTINUOUS LOAD.....		46.55

Calculating the generator output from the electrical load just found, can be done in this manner:

GENERATOR AMPERE OUTPUT = total continuous load + 10% of total load

GENERATOR AMPERE OUTPUT = 46.55 + 4.66 = 51.31

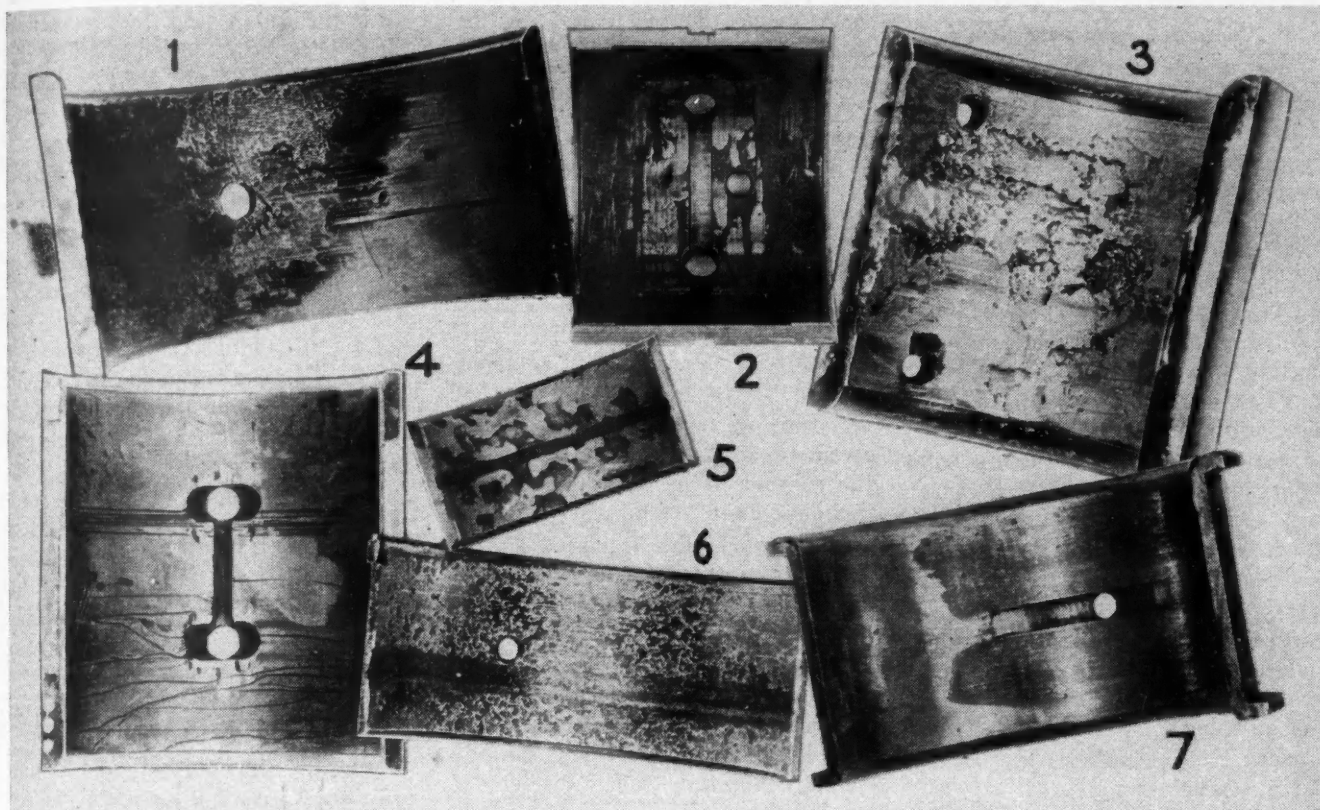
GENERATOR OUTPUT should be about 50 amperes, which will be correct size for this tractor-semi-trailer.

Fog lights, added in the example above, are not used on all tractors. But many tractors have other additional items of electrical equipment such as electrical windshield wipers, radios, or higher candlepower bulbs in the marker lights. This additional equipment should be included in the calculations of the total continuous load necessary for choosing the generator.

A special generator is needed in operations where truck speeds are low and the delivery or loading stops are long. The engine then operates a large part of the time below the speed at which the standard generator starts to charge the battery—about 600 rpm to 700 rpm of the engine. In order to keep the battery charged under these conditions, a generator of the low-cut-in type, which will start to charge at about 400 rpm, should be installed.

Along with the generator in each truck is matched a normally correct-size battery. Optional storage batteries of larger capacity are available. If the trucking operation is in a cold climate where the starting load is very heavy, the larger battery may be necessary.

Electrical systems of 12-volt potential are standard on very heavy-duty model trucks, and optional equipment on other models where the 6-volt is standard. The standard system—whether 6- or 12-volt—is usually satisfactory for most normal operations. Other operations where the starting loads are heavy, or there is additional electrical equipment, may exceed the capacity of the 6-volt system and require a 12-volt system. The 12-volt system should also be considered from the viewpoint of interchangeability. A fleet made up mainly of trucks with 12-volt system should standardize their new trucks to this same electrical system in order to simplify parts and maintenance problems.



Photographs Courtesy of Federal Mogul Corp.

Typical bearing failures arising from: 1. Insufficient oil clearance 2. Acids in lubricant 3. Failure of oil supply
4. Foreign particles 5. Normal fatigue 6. Abrasives from overhaul 7. Lack of oil

Trouble Shooting

Engine Bearing Failures

A study of common bearing troubles, featuring practical pointers
on diagnosing premature failures in a move to prevent recurrence

WHEN engine bearings fail in service, it is the mechanic's responsibility to determine the cause. Troubles supposedly corrected without properly diagnosing the reason will reappear altogether too soon. The life of a replacement depends upon an intelligent diagnosis of the failure. In general, types of failures can be determined from the condition of the bearing, the appearance or the wear.

Dirt is probably one of the greatest enemies of engine bearings, causing as much as 90 per cent of some fleet's bearing troubles. It is often

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difficult to tell, however, when an engine is torn down, whether the dirt has entered during overhaul, from carbon deposits, addition of contaminated lubricants or from foreign material brought in through crankcase ventilation. Fortunately, all these avenues can be controlled by careful maintenance and operation,

so that there should never be a second failure from the same cause. Better serviced air filters, more frequent changes of oil filters and more attention to the cleanliness of oil filling equipment, together with proper overhaul methods should eliminate this condition.

Bearings failed as a result of dirt may have a scurvy appearance with foreign particles imbedded in lining, indicating that the engine had not been cleaned after a rebore job or after cylinder reconditioning. Bear-

(TURN TO NEXT PAGE, PLEASE)

BEARINGS TROUBLE SHOOTING COMMON FAILURES

Bearing Failures

(Continued from page 53)

ings assembled over a dirty crankshaft or bearings installed without being properly cleaned may show up as pock-marked, with foreign particles imbedded in spots.

Large metal particles will leave definite ridges or paths similar to the track of a snail. There will be definite channels cut into the surface, starting from the oil hole and running in line with the oil flow, eventually leading to the bearing edge. Large scratches of this nature will soon cause complete failure because each crevice permits an oil bleed which will drain off the lubrication from the bearing and reduce its load carrying capacity. If the channels start at no particular source, it may indicate that the dirt or abrasive material was present when the bearing was assembled. If the source of the channels is at the oil hole, dirty lubrication is generally indicated.

Abrasives left in the engine during overhaul may show up in a loading up of the bearing surface with dirt. Oftentimes these particles displace the babbitt, raising it around the particles and reducing the oil clearance. The result is a development of excessive heat which melts the babbitt so that it may look as if overheating were the trouble. This often causes fatigue in localized areas.

Not all dirt may be evidenced on the bearing surface. It can do as much damage if particles lodge behind the shell. This lifts the insert from the seats and impairs the proper dissipation of heat to the block or rod. Melted babbitt may result. Again, such a condition will cause a high spot which will carry the load until it is broken down. The babbitt will eventually be rubbed off at these

spots, the clearance will probably increase and failure will be sure. Dirt held under the insert reduces the bearing contact, increasing the unit pressure and causes flexing of the bearing. The result is lateral cracks in the babbitt comparable to those arising from fatigue failures.

Partial Load Distribution

A FREQUENT cause of premature failures is partial load distribution, a condition arising from any number of factors all centered around bearing-to-shaft contact. Insert bearings must have perfect contact between the insert and saddle or the con-rod to provide proper heat dissipation and to maintain the cylindrical form of the bearing. Localized pressure at any spot will cause overheating and melting of the babbitt.

A bent con-rod will cause failure for this reason as will a misaligned bearing cap, out-of-round saddle bore, crankcase distortion, out-of-round connecting rods, misaligned crankshaft or cylinders bored out of line. Chiseling of the bearing on the back to reduce bearing clearance, a common shop malpractice, will result in early failure because full shaft contact will not be possible. Out-of-round bearing saddles permit the bearing to take the same form, resulting in partial bearing-to-shaft contact. Even large size con-rods sometimes distort under heavy loads and high speeds.

A distorted crankshaft held in alignment by force imposes heavy loads on main bearings and usually shows up in failure of the center bearings while the end ones remain

in apparently good condition. A warped or bowed crankcase will show up in the same type of failure. If the block is found to be misaligned, the best possible remedy is to use semi-finished bearings and align bore them to true dimension.

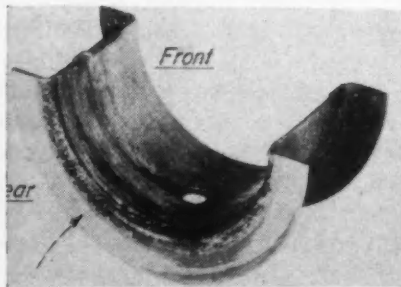
One of the primary causes of misalignment of either the crankcase or the con-rods is improper bearing cap tightening. Far too many mechanics still rely on "feel" with the result that the adjustment is apt to be too tight or too loose. For satisfactory results the cap must be tightened with a torque indicating wrench with just the right tension to hold the bearing tight enough for the two bearing saddle halves to act as one solid piece. If the nut is pulled too tight, the saddle may be stretched out of round or the threads may be stripped enough to give way under high stress. If the adjustment is too loose, the insert may slip in the saddle, resulting in overheating and early failure.

Con-rods can be misaligned in several ways which will speed failure due to impartial load distribution. The rod may be twisted, putting extra strain on the lower end bearing as well as the edge of the insert. The small end will ride against the piston boss, tilting the crankpin end. The seat may become elongated after long periods of service, a condition which reduces the oil clearance near the parting faces of the rod and cap. A heat zone is created in these areas, and failure follows. Out-of-round crankpins are another reason for impartial load distribution.

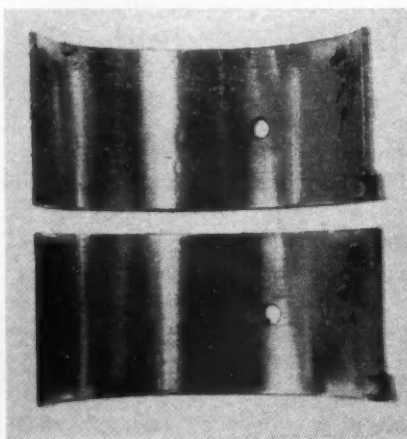
Incorrect Fitting

A LOOSE bearing can be identified by shiny or smugged areas on the back of the insert, the parting faces and the locking lug. Loose inserts permit the oil to lodge between

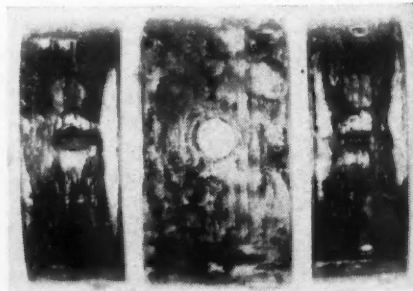
Excessive crankshaft thrust



Out of round con-rod bore



Bearing loose in seat



the shell and the back, hindering proper transfer of heat. Mottled steel on the backs of the bearing will point to a loose insert, caused by lack of bearing crush, oversize bore or deflection of the rod bore. When found on a connecting rod, it may be an indication of overspeeding. A loose bearing will flex and frictional heat will develop, causing scoring and failure. Bearing crush built into the insert dimension by the manufacturer is designed to eliminate this condition by holding the insert clamped solidly in the seat when the bolts are tightened. Insufficient crush will not allow for an adequate film of oil between the shaft and bearing. The babbitt will eventually score from overheating. This condition is usually the result of filing of the parting faces of the shells.

On the other hand, excessive oil clearance, especially of the main bearings, will not permit adequate lubrication of the connecting rods. This condition also allows extra metal to be forced into bulges near the parting faces, creating areas of excessive pressure and resulting in early breakdown of the babbitt.

Insufficient oil clearance will allow metal-to-metal contact and result in a wiping action on the part of the shaft. Babbitt will be wiped out of the insert in definite grooves, while scoring will be evident. This condition will closely resemble that caused by inadequate lubrication, although scuffing and scarring will appear to be rough and pitted, with scoring quite pronounced.

It is appalling to find that so many bearing failures are purely the result of malfitting practices in the fleet shop. These conditions, however, should and can be controlled quite easily with more attention given to mechanic training. Experience has shown that it is expensive to try to fit bearings by the trial and error methods. Many sets of new inserts have been ruined because the mechanic guessed at rather than measured the bore of the bearing seat and the diameter of the shaft. Many times nicks, burrs and dirt make for improper readings on instruments.

Many fitting failures can be eliminated by simply comparing the new bearing with the old one, with respect to the grooves, position of oil holes, flanges, etc. Inspection may avert a breakdown.

TRUBLE SHOOTER'S CHECK LIST

Causes of failure

Dirt from—

Careless service methods
Contaminated oil
Infrequent oil changes
Dirty oil filters
Dusty operation

Improper fitting through —

Distorted con-rods
Out-of-round journals
Tapered journals
Scored bearing surface
Warped crankshaft or block
Improper clearance
Use of inaccurate tools
Improper tensions of studs
Mixing con-rod caps
Installing shells backwards
Filing shell to fit
Chiseling shell to reduce clearance
Excessive crankshaft end play
Dirt between brg. and rod bore
Mutilated bearing surface

Corrosion from—

Crankcase acid vapors
Overcooling
Overheating
Inferior type of oil
Incomplete combustion
Poor crankcase ventilation
Engine blow-by
Infrequent oil changes

Improper vehicle operation

Overspeeding
Overloading the vehicle
Lugging on hills
Spark detonation
Improper engine break-in
Racing a cold engine
Use of wrong type, grade oil
Improper fuel
Insufficient oil
Improper timing

Improper Assembly

IMPROPER assembly, another practice directly the responsibility of the mechanic, is frequently the cause of early failures of bearings. Sometimes the bearing caps are thrown out of alignment when they are tightened with an oversize wrench. If the shoulder of the wrench presses against the bearing cap, it may be thrown sideways, and result in partial load distribution. Mixing of bearing caps or installation of bearing caps backwards is another frequent cause of bearing comebacks. Rods and bearing caps are machined in married parts and must be kept in pairs if precision fitting is possible.

Surprisingly enough the installation of improper size replacement bearings is a common cause of early failures. Several models of engines

Lubrication failure

Failure of oil pump
Clogged oil pump screen
Excessive engine sludge
Excessive engine temperature
Use of too heavy oil in winter
Insufficient engine warm up
Insufficient quantity of oil
Crankcase dilution
Inadequate crankcase ventilation

Result of failure

Color

Black deposits on O.D., loose in rod bore
Pitted—corrosion—high temperature
Coppery color—corrosion—low temperature
Steel discolored (blue) overheating
Bright spots on I.D.—localized overheating
Metal to metal contact on I.D. (bright surface). Breaking through oil film

Condition

Broken babbitt—dirt behind shell
Scurvey appearance—foreign particles
Pitted marks—dirty oil or assembly
Melted babbitt—overheating
Metal wiped out—too close fit—Lack of lubrication
Scored, ridged—contaminated oil
Cracks, broken areas—normal fatigue
Uneven wear—misalignment
Excessive crush—out-of-round bore
Rough surface—excessive clearance
Worn upper half both halves of main—overspeeding
Worn lower half cap half rod bearing—overspeeding
Worn upper half of main—lugging
overspeeding
Worn lower half of main—lugging
Worn upper half of con-rod—lugging

deviate from standard dimensions of cylinder bore, main and rod bearings, and these differences must be watched carefully so that proper size inserts are used.

Improper cleaning procedures after a bearing or overhaul job account for a great proportion of failures. The block should be cleaned after valve grinding or cylinder boring. All oil passages should be flushed clean with kerosene or flushing oil. Bearings should be kept in their cartons until they are used. Even the dust and dirt from a normal shop, accumulating on oily parts is sufficient to contribute to early wear. A particle of dirt one half the size of the diameter of a hair placed on a bearing may contribute to failure. Mechanics frequently forget to keep hands clean when assembling.

(TURN TO NEXT PAGE, PLEASE)

Bearing Failures

(Continued from page 55)

bling bearings. Manufacturers insist that even metal particles lodged in the pores of the skin are detrimental to bearing life. It is imperative, then, that hands be washed in solvent, not wiped on an oily rag, that work benches be clean, that parts be washed and the shop area free from excessive dust if the longest possible life is to be expected from the bearing job.

Lubrication Failures

LUBRICATION failures might be divided into the following categories, any of which will contribute to early bearing trouble: failure of the oil pressure, insufficient quantity of oil, improper grade and type of oil, contaminated lubricant. Oil pressure failures may be the result of a clogged oil screen, broken oil lines, defective oil pump drive or a broken pressure relief valve spring. A low oil level may allow the pump to pump a mixture of air and oil, a condition which results in insufficient amounts of oil reaching the bearings. It is important that the level be kept at recommended levels especially with high speeds, when the oil does not have sufficient time to return to the pump, thereby lowering the level still further.

Again a low oil level does not allow proper cooling of the lubricant at the crankcase before it is recirculated. This condition results in overheated oil, and eventual bearing failures due to overheating.

Oil starvation or insufficient quantity of oil reaching the bearings may be the result of worn bearings. In this case the main bearings are flooded while con-rod bearings receive insufficient lubrication. One of the frequent causes of oil starvation is use of either too heavy or too light oil. Bearings failed from this cause may be scuffed and scarred and will eventually lose their babbitt through overheating.

Some types of failure, especially when one bearing gives out, are hard to explain. Such conditions may be the result of pure fatigue, but probably are due to lubrication failure of that particular part, a result of plug-

ging of the lubrication passages. Sometimes adequate lubrication is interrupted when the bearing insert shifts due to insufficient press fit. The shifting of the bearing cap will result in the same condition. Single bearing failures may be the result of fillet ride, resulting from improperly ground journals, a condition which will seal off the oil flow and result in starvation of the bearing.

A great deal of oil starvation difficulties occur during the warm-up period, when the driver fails to allow the engine to normalize before gunning it. A great percentage of wear takes place during the first few revolutions of the crankshaft. Again, bearings are frequently starved following an overhaul, when clearances are close and the engine is allowed to idle too slowly. The condition occurs in new engines if they are not properly broken in.

Bearing failure from oil starvation is usually rapid due to development of excessive heat. The lead content of tin-based babbitt softens around crystalline structure, producing a cracked appearance. The babbitt softens and islands are formed similar to that in a defective asphalt pavement.

Corrosion

HIGH temperatures are conducive to the formation of acids which are harmful to bearings, especially cadmium alloys and copper alloy types. A black varnish on the babbitt, as long as it is a surface deposit, is not harmful, but if the black deposits have cavities, it is an indication that the bearing surface is breaking down due to corrosion. A shiny, oily, black condition can be easily removed and is not a sign of bearing failure. It is sometimes hard to determine whether the particular discoloration is really evidence of failure, and the mechanic may have to resort to a cleaning up of the bearing before making a decision. Bearings with deposits can be immersed in a solution hot dip cleaning, washed with soap and water and rubbed briskly to remove remaining loosened deposits. After this if pit marks, surface corrosion, porous surface is detected, the bearing should be replaced.

Corrosion may be caused by many factors, all well beyond the scope of this article. The mechanic will know that if evidence of corrosion is

found, it is caused by either high temperature operation, overcooling, unsatisfactory type of oil, inadequate crankcase ventilation. Frequently the type of operation will need to be studied, the driving habits, as well as the corrosion conditions before remedial measures can be taken.

Normal Fatigue

FATIGUE failures will show up in surface cracks in the babbitt. This is caused by the normal flexing of the bearing under heavy loads and high temperatures. While accelerated by fatigued con-rods, loose inserts, dirt under the bearing, many such failures are normal after extended service. The final stages of this type of failure will show up in a peeling of the babbitt when oil entering the cracks lifts up the metal. When one bearing is found in this condition, all should be replaced.

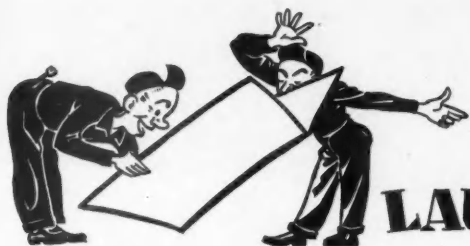
While fatigue may show up regardless of operation, the following conditions will accelerate it to a great extent; racing the engine in low gear, using the engine as a brake without shifting to proper gear ratio, blow-by which passes hot gases to enter around the pistons and rings. Use of low octane gasoline combined with heavy loads may result in fatigue failures as a result of the higher heat generated.

Engine detonation imposes heavy loads on main and rod bearings, the failure showing up as cracks and broken spots over the entire area of babbitt.

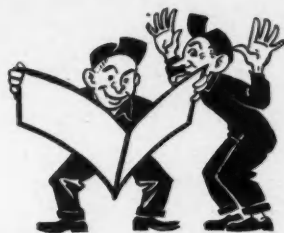
Operational Factors

LUGGING of the engine at low speed is one of the most common causes of premature bearing failures due to operating factors. Failures of this type will show up in wear of the upper connecting rod bearings, while fatigue failures will be evident in the lower half of the crankshaft bearings.

Excessive speeding, either through normal operation or through use of engine as a brake will show up in definite bearing patterns. High speed is indicated if the bearing wear is evident on the lower half of the rod bearings and on the upper half of the mains. The lining will be cracked or broken away from the back. When this condition is noted, it is wise to replace all bearings as all have been subjected to excessive strains and may fail prematurely later.



LAUGH IT OFF



The truck dispatcher was a patient in the hospital. Awakening from a major operation, he noticed that the blinds of his room were drawn. "Why are those blinds down, doctor?" he said.

"Well," said the physician, "there's a fire burning across the alley and I didn't want you to wake up and think the operation had been a failure."

CCJ

The president of Fleety-Fleet Express was interviewing his eldest employee, the building custodian, prior to retiring him on a pension.

"I be eighty-six years old, sir," boasted the old geezer, "and I don't have an enemy in the world."

"What a beautiful thought," murmured the president.

"Yessir!" continued the ancient one. "I've outlived 'em all!"

CCJ

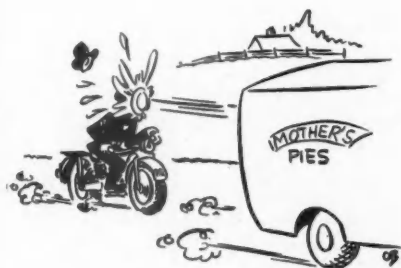
The coach at Rah Rah College was being entertained at a dinner given in his honor by the local association of motor carriers.

"What's the secret of your success?" asked one of the truckers. "You haven't lost a football game for years."

"Oh, I just get good boys!" replied the coach.

"Good boys!" cried another operator. "How do you build 'em up? Nobody ever heard of 'em before you get 'em, then nobody forgets 'em, How and where do you find them?"

"Well, it's this way," was the answer. "When I need new players I take a trip around the country and look over the farms. Whenever I see a boy plowing, I ask him the way to the nearest garage. If he points with his finger, I go by. If he points with his plow, I take him."



A motorist driving along with the top of his car down was wearing a bright checkered suit, a baby blue ascot tie, yellow shirt and a red beret. A motorcycle cop hailed him and told him to pull over to the curb.

The fellow in the red beret stopped his car and asked, "What's wrong, officer? I haven't violated any rules of traffic."

And the cop said, "I know you haven't, I just got a hankerin' to hear you talk."

CCJ

THE TWO STOOD ON THE DOORSTEP
THEIR LIPS TIGHTLY PRESSED.
THE FATHER GAVE THE SIGNAL
THE BULLDOG DID THE REST.

CCJ

Enroute to answer a service call in the wee hours of morn, the road mechanic stopped at a small all-nite beanery for mud and sinkers.

Although the place looked none too sanitary he gave his order and sat back to relax a moment. Minutes later as he swallowed the last drop of coffee and sat the cup down, he noticed a foreign object in the bottom. Calling the waitress, he indignantly demanded, "What does this mean, there is a cockroach in the bottom of my teacup."

"Listen, tall, dark and greasy," snapped the waitress. "If you want your fortune read, go see a gypsy!"

CCJ

The semi-trailer manufacturer and a group of his business associates were vacationing in Florida, where they fished almost daily. One day they noticed a pretty girl fishing off the pier, and as they watched she caught a very large and beautiful fish—but immediately threw it back into the water.

A few minutes later she caught another—even larger than the first. This she threw back also. After half an hour she caught a very small fish. With a sigh of satisfaction she packed up her equipment and prepared to leave.

At this, the trailer tycoon could contain himself no longer. "What kind of fishin' is that," he demanded, "throwin' back the good fish and keepin' that puny one?"

The young lady smiled at him sweetly. "I have a very small frying pan."

Claim Agent: "I understand your wife is a finished singer."

Maintenance Superintendent: "No—not yet—but the neighbors nearly got her last night."

CCJ

Joe, our janitor on the freight platform, had a habit of going home three or four times a week about three sheets to the wind, so his wife determined to teach him a lesson. With the aid of a sheet and a floor lamp she made a fair imitation of a ghost. She went in and shook her husband.

"Wash thish?" Joe murmured sottily.

"This is the devil," was the answer.

"Shake, ole horsh," said Joe, "I married yer sister."

CCJ

PLUMBER: "I'VE COME TO FIX THE OLD TUB IN THE KITCHEN."

SON: "MA, HERE'S THE DOCTOR TO SEE THE COOK."

CCJ

A male nurse in a mental hospital spotted a patient with his ear pressed to the wall listening intently. The patient held up a warning finger, then beckoned the nurse to come over quietly. "You listen here," he whispered.

The nurse put his ear to the wall and listened a few moments. Then he turned to the patient and said, "I can't hear anything."

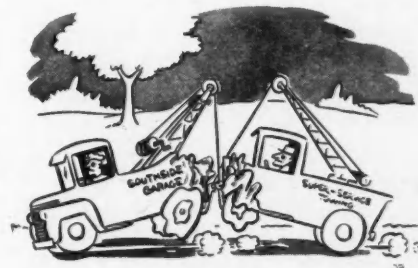
"No," said the patient knowingly, "and it's been like that all day."

CCJ

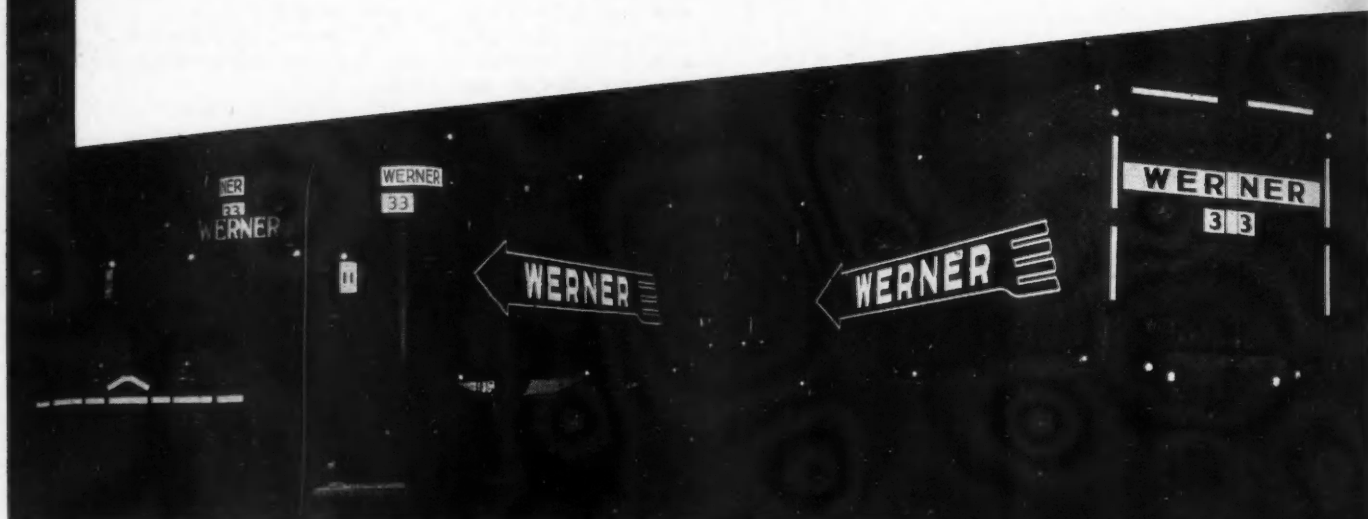
Visitor: "Well, and what are you going to be when you grow up, little boy?"

Little Boy: "Well, after I've been president for a while to please mother, and a lawyer a while to please dad, I'm going to be the best darn taster the ice cream company ever had."

Resume Work



REFLECTIVE



Werner Transportation Co. of Minneapolis has achieved the results shown

above with Scotchlite materials. Note both direct and reverse color effects

Millions of tiny glass spheres applied to plastic sheets or sprayed on special binder reflect outlines, names or trade marks; promote night safety and goodwill

V MICROSCOPIC spheres of glass, coated on a plastic backing or applied to a special fluid binder, are adding new brilliance to America's night-time highways and new safety for fleet operations after dark.

The materials provide bright reflective protection for trucks and buses, are applied with adhesive or a spray gun depending on the type, and withstand weathering and washing without losing their brilliance.

Although used for years on high-

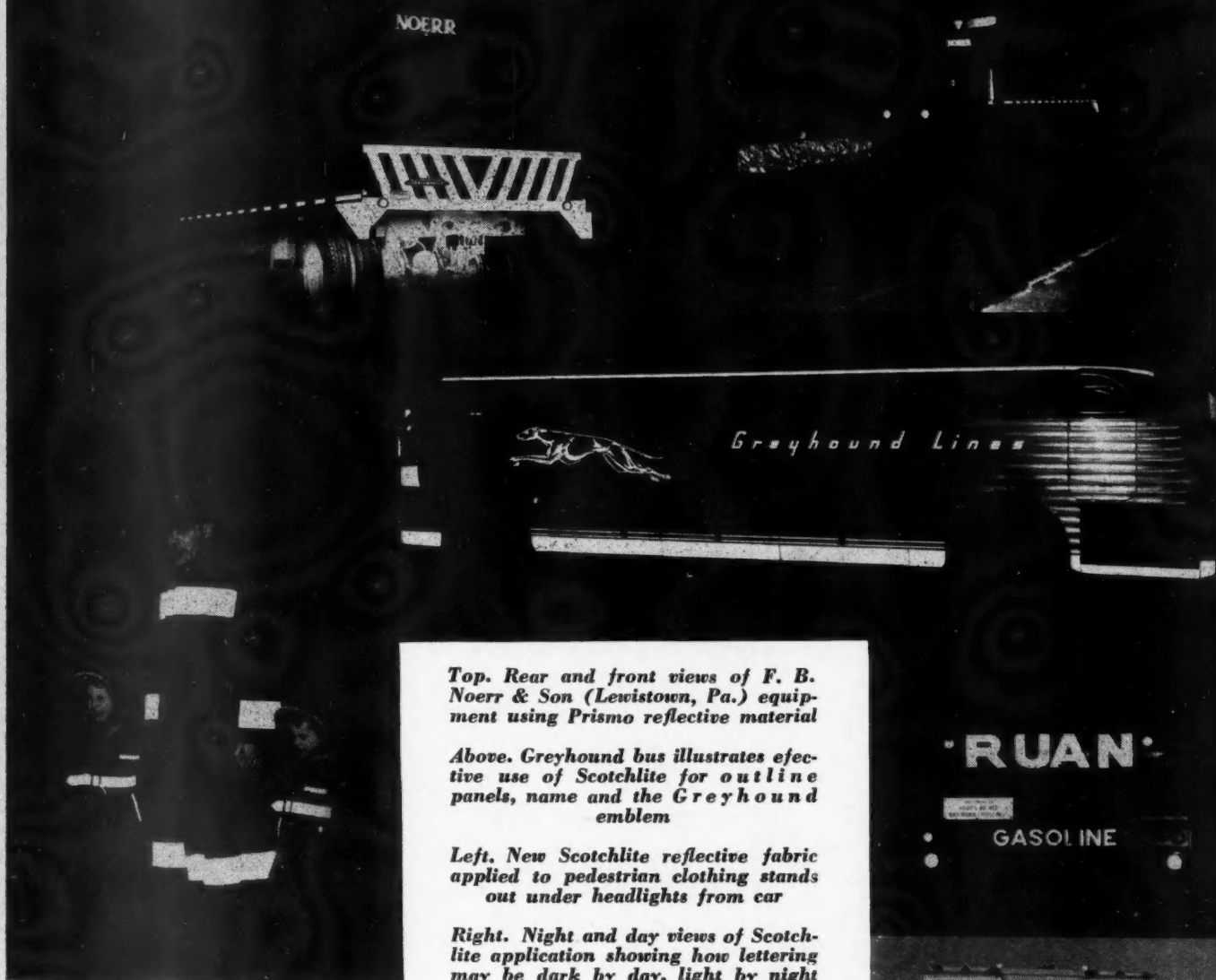
way signs and markers, the materials only recently have been made available for a wide variety of fleet applications. Repeat orders from scores of fleets who have already used them indicate the nature of the results.

The two principal products in this field known to **COMMERCIAL CAR JOURNAL** are "Scotchlite" made by the Minnesota Mining & Mfg. Co., St. Paul, Minn., and the "Prismo Sign Kit" made by Prismo Safety

Corp. of Huntingdon, Pa. If and when other materials of this type become known to **COMMERCIAL CAR JOURNAL**, they will be described in future issues. Both of these products provide controlled reflection through the use of tiny glass spheres, but

MATERIALS

**Signal Safety
and Glamorize
Trucks at Night**



Top. Rear and front views of F. B. Noerr & Son (Lewistown, Pa.) equipment using Prismo reflective material

Above. Greyhound bus illustrates effective use of Scotchlite for outline panels, name and the Greyhound emblem

Left. New Scotchlite reflective fabric applied to pedestrian clothing stands out under headlights from car

Right. Night and day views of Scotchlite application showing how lettering may be dark by day, light by night

their application is quite different.

Although COMMERCIAL CAR JOURNAL cannot presume to weigh the relative merits of these two products the important differences, as claimed by the two manufacturers, can be pointed out.

Scotchlite Sheets

"SCOTCHLITE" is supplied in plastic backed sheets with the tiny glass spheres, about 30,000 to the square inch, already applied under careful laboratory control (ac-

(TURN TO PAGE 98, PLEASE)

FREE PUBLICATIONS

USE POSTCARD—NO STAMP NEEDED

A selected list of the latest literature—
catalogs, pamphlets, charts—chosen to help
fleetmen improve operation and maintenance

L141. Truck Refinishing

This 30-page, illustrated publication on truck and auto refinishing is the result of practical experience and surveys made by a leading manufacturer in this field. Valuable information is offered for better planning and operation of the paint shop. The manual features such pointers as shop designing, equipping, operation instructions, cost controls, management, etc.

Instructions includes such subjects as removing old finishes, preparing bare metals, masking, priming, puttying, surfacing, sanding, striping and chrome finishing. In addition such procedures are discussed as engine, radiator and tire painting. Special instructions cover the technique of spray gun sign painting, and photographs show proper handling methods for the gun.

Of special interest to fleetmen will be the section on Shop Tips, a full page devoted to practical service instructions designed to produce a better refinishing job.

This manual is published expressly to aid the shop in producing quality work at highest efficiency. It is well worth considerable time and study. Available free for the writing of L 141 on the accompanying postcard.

L142. Freight Handling

This 20-page, pocket-size booklet has been prepared to assist drivers and dockmen in handling freight transported by truck. Handling tips include those practices resulting in the most common errors responsible for expensive freight claims. The helpful hints set forth the general practice of most motor carriers.

The general rules and regulations set forth in this booklet cover appearance, safety, mishandling of funds, courtesy and responsibility. Another section is devoted to regulations with regard to picking up freight from shippers. A section outlines packing requirements which should be set up to afford full protection against damage from ordinary handling while in transit.

Other handling tips cover such subjects as picking up from connecting carriers,

delivering freight to consignees, delivering to connecting carriers. Of special interest will be the section covering handling and loading tips for the driver and dockmen.

This booklet will save the hauler a great deal of time and money. Every employee handling freight should have access to this information. A single copy is available free upon request. Write L 142 on the free postcard.

L143. Truck Decal Folder

Various ways in which decalcomanias can be used on trucks are described and illustrated in a new folder "A Moving Story for Fleet Owners," now available in the truck fleet field. The folder also compares decals with other types of signs for use on trucks and cars.

JOB OBSERVATIONS

by Buster Rothman

People who aren't afraid to roll up
their sleeves seldom lose their shirts.

★ ★ ★

When you point your finger accusingly at someone else, remember
you have three fingers pointing at
yourself.

★ ★ ★

The man who knows how will al-
ways have a job. The man who knows
why will be his boss.

★ ★ ★

There are two kinds of men who
never amount to much, those who can-
not do what they are told, and those
who can do nothing else.

★ ★ ★

The turtle has to stick its neck out
or it gets nowhere.

★ ★ ★

Take a lesson from the woodpecker:
he uses his head when he works.

L144. Tube Data Sheets

A new data sheet covering tips on working various kinds of tubing has been made available to the fleet field. Few instruction sheets have covered the subject so thoroughly as this publication.

Under Tubing Handling the author takes up such subjects as annealing copper tubing, annealing aluminum tubing, uncoiling the tubing, how to straighten it and how to cut it. Special instructions cover the technique of flaring, and illustrations show how the job is done. A special section takes up the correct method of double flaring of steel tubing, while other tips give recommended procedures for handling both plastic and copper tubes.

A few minute's reading of this data sheet will enable the mechanic to do a quality job. It is free and yours for the asking. Just write L 144 on the postcard.

L145. Tire Handbook

Designed to provide a printed means by which truck operators can reduce operating costs and thus increase profits by proper selection and maintenance of tires, a new 'Truck Operators' Handbook has just been made available to the fleet field.

Featured in the volume is a discussion of the factors which can be controlled to get the most service out of any truck tire, which points out that either too much or too little air pressure decreases tire service. Suggestions for control of proper air pressures are given.

Overloading and improper load distribution, together with an easy formula for analyzing loads is also a prominent part of the publication, as well as a discussion on speeds and their effects on tire life. Matching and spacing of duels and mechanical irregularities which may cause rapid or uneven tread wear are comprehensively outlined.

The volume points out that periodic inspection prevents many tire failures, and illustrates and describes all of the most important causes of failure as well as telling how to prevent and repair many tire injuries. Ninety-three factors which affect truck tire life are listed, and data given on each type of truck tire the company manufactures.

Just write L 145 on the free postcard for a copy.



The newest in replacement parts, accessories, shop equipment, supplies—illustrated and described in brief for the fleetman

P150. Clutch Plate

The new Accurate Powerflex Clutch plate incorporates several new features. The disc itself is made up of completely separated segments. Each segment is formed with opposing flat-surface crimps which afford support to a substantially greater facing area. Because the contour of the segment has a large area of flat surface, there is much more actual contact between the disc and the facing.



The larger coil springs used on this new plate, combined with patented spring supports, are said to increase the life of the springs, and minimize spring breakage or collapse. Because the safety stops afford rigid support over the entire diameter of each end of each coil spring, the springs compress parallel and do not belly out at the center coils or rub against the retainer plate. The hub splines are chamfered or pointed so that the transmission shaft splines align themselves automatically, with the splines in the clutch hub when it is inserted.

Use Free Postcard for More Details.

P151. Lite-Guard System

The Lite-Guard System developed by International Lite-Guard, Inc., Cleveland, Ohio, is an automatic safety device which provides a system whereby both headlights of a vehicle will function even though any one of the four headlight filaments are burned out. When either filament in one or both of the double filament sealed beam headlights burns out, the Lite-Guard will automatically transfer the power to the remaining filament in said bulb and also automatically signal the operator as to the defective lamp. Due to this action the driver has two lights which will operate until he can find the oppor-

tunity to replace the defective lamp.

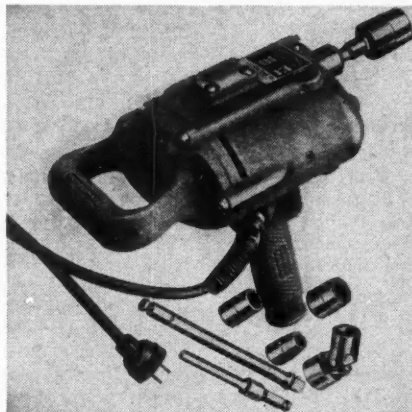
The system is composed of the unit, the indicator for dash mounting, the foot switch with complete wiring. Installation is simple, and the cost is low.

Use Free Postcard for More Details.

P152. Nut Setter

A new Speed-o-matic electric impact Nut Setter has been introduced by Illinois Gage & Mfg. Co., Chicago.

This nut setter is torqueless—it will not twist in operator's hands when nut becomes tightened. It operates at high speed, driving nut or bolt 1750 rpm at free speed. At point of resistance, impact unit automatically delivers 3000 impact blows per minute.



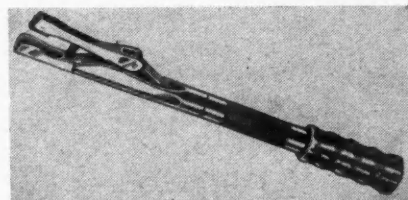
The unit is instantly reversible for removing bolts or nuts. Equipped with 25 ft of rubber-covered cord and plug with ground wire, it operates on any 110 volt, 60 cycle, A.C. or D.C. circuit. It has an overall length of 12½ in. and weighs 13½ lb. Its capacity is up to ¾-in bolts and nuts.

Use Free Postcard for More Details.

P153. Piston Setter

The Wilton Tool Mfg. Co., Chicago, Ill., has developed a new type piston setter for removing pistons from any engine. The tool is in effect a hand-operated clamp

with a threaded jaw which grips the connecting rod bolt to guide the piston over the crankshaft without damage to the bearing. One man can set pistons with this tool.



Overall length is 14½ in. The tool weighs 2½ lb, is of sturdy construction and is furnished in fine plated finish.

Use Free Postcard for More Details.

P154. Hand Cleaner

Farbach Chemical Co., Cincinnati, Ohio, announces the introduction and addition of FAR Waterless Handy Cleaner.

FAR removes dirt, grease, grime, paint, and other soiling agents without the use of water in cleaning or washing; included in the formulation is refined lanolin for protecting the hands against chapping and chap cuts.

Use Free Postcard for More Details.

P155. Spark Plug

The Electric Auto-Lite Co. has announced the development of a new spark plug with a built-in resistor which suppresses spark plug interference with radio, radio-telephone, radar and television reception. The new resistor spark plug is said to provide smoother operation and improved economy. The plug features a built-in 10,000 ohm resistor which reduces electrode erosion thus allowing for a wider gap setting. Other benefits claimed include smoother idling as the wider gap helps to eliminate occasional missing; reduction of ring and cylinder wear when lubrication is washed away by gasoline not burned as a result of occasional misses; reduction of misfiring due to lean spots in carburetion;

(TURN TO NEXT PAGE, PLEASE)



(Continued from page 61)

assists in the burning of leaner mixtures bringing about improved engine economy at idle and throughout the speed range; increases electrode life up to 200 per cent and more.

Use Free Postcard for More Details.

P156. Extinguisher



Power-Pak Tire Inflator-Fire Extinguisher units developed by Power Pak Products, Inc., Buffalo, N. Y., are now available in a heavy-duty size. Big brother to the smaller 10-oz automotive unit, the heavy duty model contains 2½ lb of CO₂. With this increased capacity.

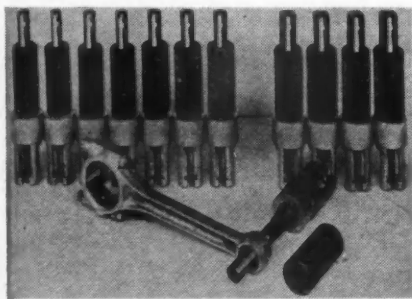
the new Power-Pak will inflate not only the largest commercial tires (9:00 x 10 to 90 lb) but also a dozen average size passenger tires (to approx. 30 lb each).

Use Free Postcard for More Details.

P157. Sunnen Mandrels

Sunnen Products Co., St. Louis, Mo., presents two new series of mandrels.

The new mandrels for fitting pins in connecting rods are made of steel—and provide much greater service life. The short



stone and shoe assure extreme accuracy and a straight round hole—free from bell-mouth. Very little truing is required. These mandrels cover the range from .650 in. to 1.024 in.

For fitting king pins Sunnen offers a new line of multiple stone mandrels that maintain a perfect alignment between the bushings. These mandrels come with low cost wear shoes that can be replaced when they become worn. The mandrels handle the popular king pin sizes—from .733 in. to 1.500 in.

Use Free Postcard for More Details.

P158. 5th Wheel

Increased efficiency and driver comfort with 145-lb saving in weight are characteristics of a new torsional rubber mounted 5th wheel just announced by Highway Trailer Co., Chicago.



The new 5th wheel is full 36 in. wide, thus giving the benefit of increased bearing area. With the new-type torsional rubber mounting replacing the former coil springs, "telegraphing" of noise from trailer to cab is eliminated.

Weight of the trailer, levelling the new 5th wheel torsionally, twists the rubber bushing, but as soon as trailer is uncoupled, the tails automatically return to the down position. These rubber bushings need no lubrication.

It is claimed that the new torsional rubber bearing will resist and partially absorb

P160. Controlled Crankcase Ventilator

The problems created by crankcase dilution are successfully overcome by Oildex, according to its manufacturer. This controlled crankcase ventilator, is manufactured and distributed by the Oildex Corp., Cleveland, Ohio.

The unit is designed and engineered for the purpose of removing diluent vapors from the crankcase before they condense into damaging liquid impurities. The ventilator extracts, then filters these vapors and returns them through a volumetric control valve to the cylinders, where they are utilized as additional fuel.

Oildex can be installed on any conventional type gasoline engine, according to the manufacturers. It receives its suction power from the intake manifold; the vacuum sucks out blow-by vapors that would otherwise condense in the crankcase and valve assembly compartments.

These vapors are then filtered and cleaned, passed through the control valve to the intake manifold and to the engine, increasing power and gasoline mileage, and preventing crankcase dilution.

Use Free Postcard for More Details.

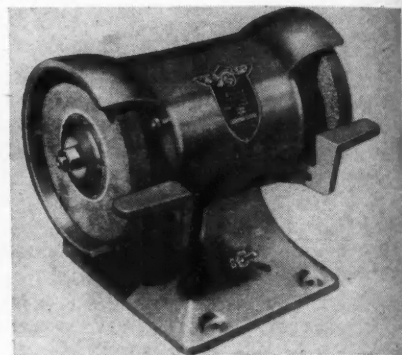
radial dynamic forces up to 220,000 lb without damage, as the rubber flows axially on the loaded side and circumferentially away from the loaded side.

Another feature of the new 5th wheel is simplicity of construction. It contains 23 fewer parts than the former model.

Use Free Postcard For More Details.

P159. Bench Grinder

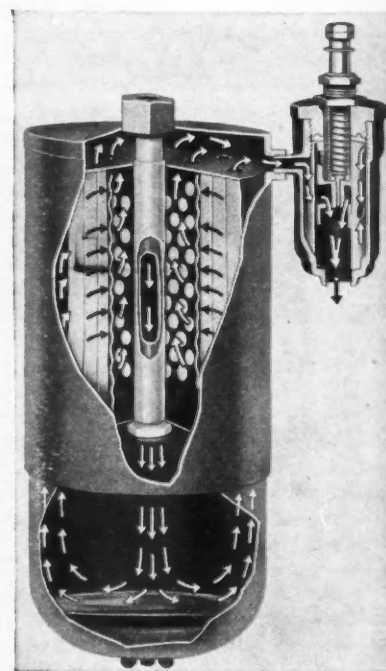
The United States Electrical Tool Co., Cincinnati, has announced a new "Reddy" 6 in. utility Bench Grinder, as now available. It has ball-bearing shaft support,



is sturdily built, well balanced and designed for general purpose grinding within rated capacity. The motor is 1/3 hp capacitor type, ball-bearing, totally enclosed, 3450 rpm load speed.

Reddy is equipped with 1 coarse and 1 fine abrasive wheel, 6 in. x ¾ in. x ½ in.; tool rests adjustable to wheel wear; 7 ft. 3-conductor rubber covered cable. It weighs only 45 lb and can be furnished for 110 or 220 volt, 50 or 60 cycle, 1, 2 or 3 phase AC.

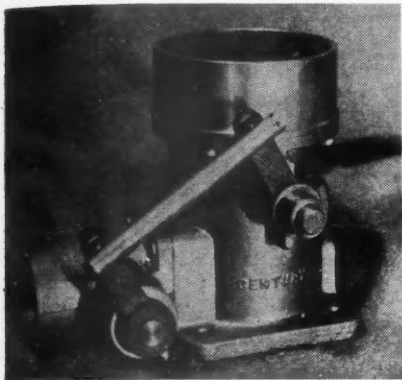
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P161. New Carburetor

A new Century 3C carburetor for liquid petroleum gas with the controlled combustion principle has just been introduced by Century Gas Equipment Co., Lynwood, Calif.

The controlled combustion principle of this new carburetor meters or varies the proportion of air as well as gas intake from closed to full open position. This controlled combustion principle eliminates the risk of dilution by liquid gaso-



line and carbon formation in the engine provided the pistons do not pump oil. Overhauls are said to be reduced. Installation of this equipment consists of a tank, converter and the carburetor.

Use Free Postcard for More Details.

P162. Lock Nut

Swallow Airplane Co., Wichita, Kan., has developed a lock nut with replaceable locking unit which may be used with either fiber or metal washers, thus allowing the use of this nut where resistance to heat is essential.

Full holding strength of the lock nut with replaceable locking unit is restored by replacing only the locking unit retained in the crown of the nut. Because replacement of the locking unit requires no tools and the cost of the locking unit



itself is only a fraction of the cost of the entire nut, savings are possible over the replacement of the entire lock nut.

Use Free Postcard For More Details.

P163. New Brake Lining

A new wire molded brake material developed by The Raybestos Division of Raybestos-Manhattan, Inc., Bridgeport, Conn., is said to eliminate the warping and curling characteristic of wire molding.

The new wire molded lining as a harder, flat surface claimed to give the material

much greater wear resistance, flexibility and stability of friction. It is said to make for less fading, less running drag, fewer adjustments and longer-lived quicker installations.

The new material is boxed in drilled and countersunk sets and will also be available in standard rolls.

Use Free Postcard For More Details.

P164. Crankshaft Grinder

The Waterbury Tool Co., Division of Vickers, Inc., Waterbury, Conn., has recently placed a new portable crankshaft grinder on the market. With this device the crankshaft stays in the block and the unit works from the top of the block, with only the chassis jacked up high enough to remove the oil pan.

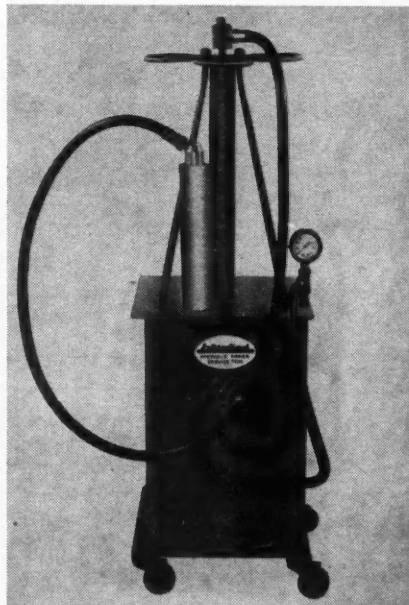
This grinder is said to handle full range in-line engines. One electric motor drives the crankshaft while another $\frac{3}{4}$ hp. motor drives the grinder through a flexible shaft arrangement. The grinding wheel is full width of throw, eliminating need of feeding the wheel across the throw. A hand micrometer feed for regulating cut of wheel, graduated in .0005 in., is located at end of yoke. The machine is said to be simple to adjust and operate.

Use Free Postcard for More Details.

P165. Sleeve Press

Announcement of a new type Hydraulic Power Service Tool for removal and insertion of cylinder sleeves has been made by the International Tool Corp. of Chula Vista, Calif.

This power tool inserts and extracts both steel and cast iron sleeves, and will remove and insert all eight sleeves in the average Ford or Mercury engine in 15 to 20 min.



The steady even pressure provided by the power unit is said to eliminate any possibility of distortion or radial cracks to the sleeves, harm to the block or cylinder walls.

Air pressure of 40 to 60 lb provided by any standard type air compressor is all

that is needed for its operation. One hundred fifty lb of air pressure generates 17,250 lb of hydraulic power at the ram, which engages the sleeve for its removal or insertion.

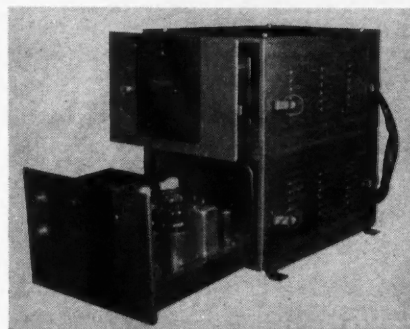
Adapters for removing and inserting spring shackle bolts in Fords, Mercurys-Lincoln Zephyr's series and Ford Trucks are also available for use with the same unit.

Use Free Postcard for More Details.

P166. FM Radiophone

Philco Corp., Philadelphia, Pa., has recently announced a new FM Radiophone Communication System with a new 30-44 MC "Channel-Saver" circuit.

This development is said to permit higher standards of efficiency in half the channel width. It operates on 20KC channel instead of the 40KC width heretofore required by available equipment. All receivers are double conversation super-



heterodynes using the advanced FM detector and two separate low temperature coefficient crystals to control the heterodyne circuits. All metal parts are plated and Chromac finished as a protection against rust and corrosion.

The new units feature vertical or horizontal mounting, low battery drain, easy installation as well as low upkeep cost.

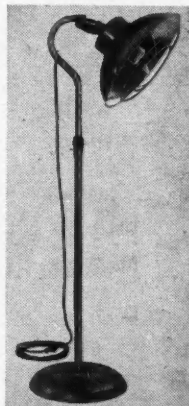
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P167. Drying Lamp

The Dry-Quick Paint Drying Lamp which has just been introduced by the Dry Clime Lamp Corp. of Greensburg, Ind., has a lava-coated dark burning infra-red generating unit in place of a bulb. It is built to withstand abuse and rough handling without danger.

Because of its light weight the Dry-Quick Lamp does not require casters. It is not top-heavy. It is easily adjusted to the proper height and angle for the job to be done, and it occupies little space when not in use. It radiates infra-red rays over a wide area and will dry an entire fender at one time.

Use Free Postcard for More Details.
(TURN TO PAGE 240, PLEASE)



9 Ways

to Reduce SLUDGE

Engineer describes corrective measures for low temperature sludging of which improved low-speed carburetion, positive crankcase ventilation at low speeds, and high-set engine thermostats head list

ON THE BASIS of the test evidence, the most obvious remedy for minimizing oil contamination and low temperature sludge deposits would be to eliminate engine idling. Unfortunately, this is impossible to accomplish in urban communities with traffic signals on every main and many secondary street crossings, and in many operations of the stop-and-start type. Additionally, cold starting, engine warm-up, accelerating, coasting to a stop, or using the engine as a brake are all probably in the same category as straight idling, insofar as blow-by contamination is concerned.

Since we cannot ask engine operators to change their driving habits, we must look at the engines for ways and means of improvement. The table on opposite page itemizes engine modifications and corrective measures, which are listed in order of their apparent importance.

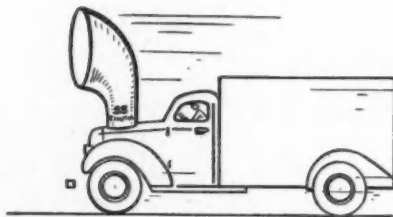
Improved Low-Speed Carburetion

SINCE the very rich mixtures produced by present day carburetors at idling and low speeds seem to be the primary cause of excessive oil contamination, improved fuel metering systems capable of maintaining

by **CARL W. GEORGI***
Tech. Director, Research Laboratories,
Quaker State Oil Refining Corp.,
Oil City, Pa.

more efficient air-fuel ratios over a wide speed range can probably be listed as the number one necessity.

Proper maintenance of fuel, choke and ignition systems to minimize rich mixtures and poor combustion are a helpful measure, but the fundamental problem seems to be one of basic design.



Positive Crankcase Ventilation

THE crankcase ventilating systems of most current engines provide practically zero ventilation at idling and low speeds, and function

* Excerpted from a paper presented at the SAE Annual Meeting, Detroit, Jan. 12-16, 1948.

effectively only at high road speeds. Since the worst conditions of contamination blow-by occur at idling and low speeds, present ventilating systems function almost exactly in reverse of the desired.

A great need exists for crankcase ventilating systems which will provide positive air flow in good volume independent of engine speed, and especially under idling conditions.

High-Set Thermostats

ALTHOUGH most engines are factory-equipped with thermostats of 140°/150°F. setting, many engines are being used with the thermostats removed or stuck in open position. Many engine owners and operators do not appreciate the importance of thermostats and either do not replace defective units or leave them entirely after one fails.

An educational campaign on the importance of thermostats, as well as development of units having longer operating life seems to be indicated. High set thermostats in the range of 160 to 180°F. will maintain higher over-all engine temperature levels, and are desirable in many engines even though they require the use of non-volatile anti-freeze in winter.

Corrective Measures

for Prevention of Oil Contamination and Sludge Deposits

1. Improved Carburetion at Idling and Low Speeds
2. Positive Crankcase Ventilation at Idling and Low Speeds
3. Cooling System Thermostats
4. Improved Jacket Temperature Control
 - a. Radiator Covers or Shutters
 - b. Variable Pitch Fans
 - c. Radiator By-pass Plumbing
 - d. Reversed Coolant Flow
5. Insulated Crank pans, Valve Compartment Covers, etc.
6. Oil Filters
7. More Frequent Oil Changes
8. Detergent Oils
9. Solvent Oils

Jacket Temperature Control

ALTHOUGH thermostats in good condition will maintain adequate upper engine temperatures, the cylinder jackets of many engines are still overcooled due to excessive radiator capacity at light loads and in cold weather. Improved jacket temperature control is, thus, another important problem requiring further attention.

Design improvements to this end which are now receiving considerable attention are radiator covers or shutters, variable pitch fans, radiator by-pass plumbing, and reversed coolant flow wherein the coolant from the bottom of the radiator enters the engine head instead of the cylinder jackets. Reversed coolant flow seems to offer interesting possibilities, since the cooling systems of present day engines put the coldest water in the cylinder jackets where it should be the warmest, and the hottest water in the cylinder head where it could well be the coldest.

Insulation

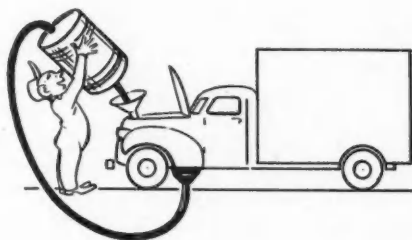
INSULATION of crank pans, valve compartment covers, etc., has frequently proved to be helpful in minimizing moisture condensation

and sludge deposition when these surfaces run overly cold in any particular engine due to design or operating conditions. However, insulation is a secondary remedy and does not correct the source of the trouble.

Oil Filters

OIL filters can be of benefit in reducing the contamination solids content of the engine oil, and will minimize sludge forming tendencies by keeping the solids accumulation from exceeding the "holding capacity" of the oil.

However, in engine operations where high rates of oil contamination prevail, filter cartridge changes must often be made at such frequent intervals, to maintain adequate filtering efficiency, as to be entirely uneconomical. Additionally, oil filters are only a secondary remedy for sludge troubles and cannot correct the basic causes.



Frequent Oil Changes

VERY frequent oil changes are sometimes adopted to minimize engine sludging troubles. Oil changes at regular intervals, as predicated by the particular engine operating conditions, are to be recommended as a means of flushing out accumulated blow-by solids and contaminants before they reach dangerous concentrations.

However, under many conditions of service, the change practice would have to be so frequent as to be en-

Low-Temperature Sludge Most Critical

There is general agreement among oil marketers that the number one cause of consumer complaints on oil performance is sludge and that these sludge troubles are not the high temperature oil oxidation type, but are the low temperature type resulting from excessive contamination with combustion chamber blow-by products.

tirely too burdensome in time and expense. And, again, frequent oil changes are not a cure or corrective for basic oil contamination.

Detergent Oils

DETERGENT type heavy-duty oils have been widely publicized and utilized, but many disappointments have been experienced when they have been used with the idea of preventing cold engine sludge troubles. It must be emphasized that the very best detergent additives have a limited capacity for holding blow-by insolubles and contaminants in dispersion in motor oil.

When oils become contaminated with several percent and more of blow-by products, detergents become hopelessly overloaded. A detergent can't replace a shovel when blow-by contamination of the oil reaches the proportions prevalent in many light-duty, intermittent operations.

Solvent Oils

CERTAIN synthetic oils, or petroleum oils containing special additives, which have a solvent action on sludges, varnishes, gums, resins and moisture, have been utilized to a limited extent as a means of preventing cold engine sludge formation. While special oils of this type have shown some indication of helping the sludge problem, their use is, again, a purely secondary remedy which does not reach the real source of the trouble.

The question is also introduced as to whether motor oils are intended to serve as engine lubricants, or whether one of the chief functions should also be to act as "garbage" collectors; the "garbage" in this case being the soots, lead salts, moisture, unburned fuel and fuel resins which work past the pistons into the crankcase. An oil containing several per cent or more of such contaminants cannot be considered as a good engine lubricant, even though the contaminants are held in dispersion or solution.

It appears more general recognition must be given to the fact oil alone cannot cure the cold engine sludge problem, and the oil must be given some measure of assistance in the way of engine design improvements.

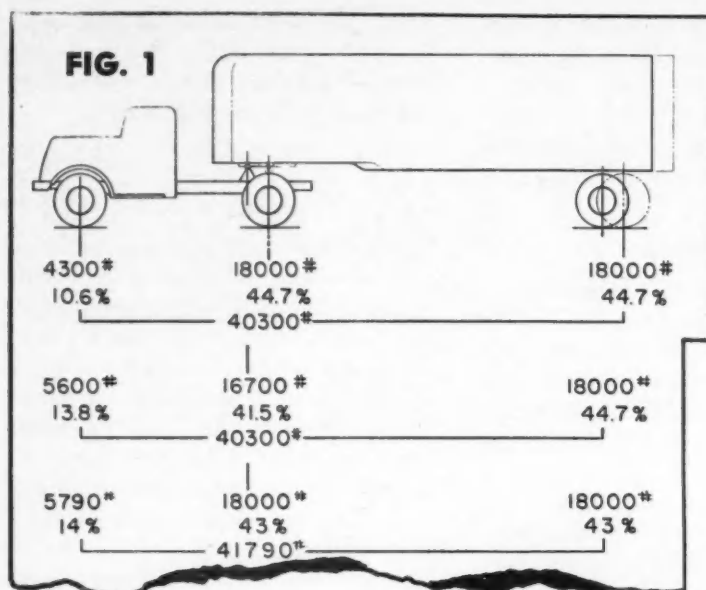
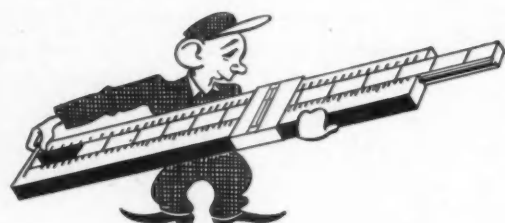
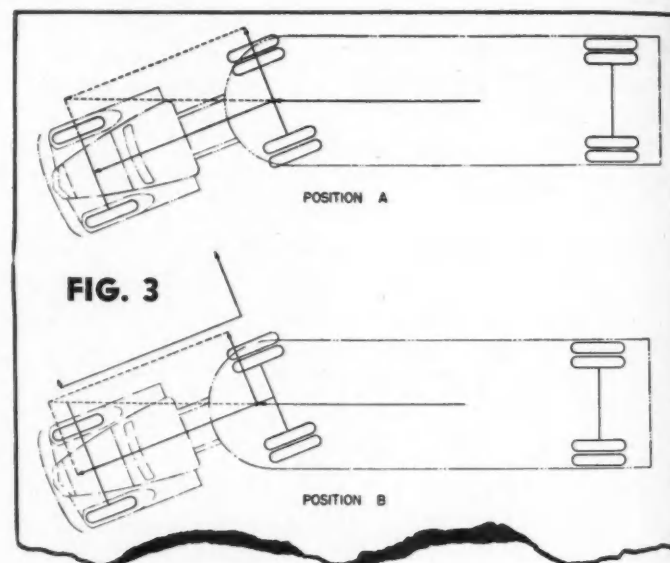
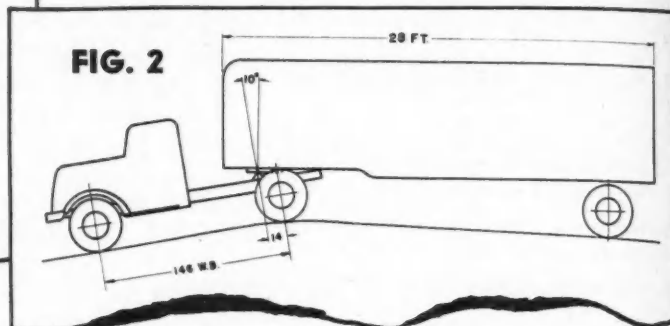


FIG. 1 (left). Effect of king pin offset on load distribution. Top drawing shows load with no offset; center, same load with 14 in. offset; bottom, same load with 14 in. offset and trailer axle moved forward

FIG. 2 (below). Effect of king pin offset on clearance angle. 14 in. is practical maximum

FIG. 3 (bottom). Effect of king pin offset on steering. Side thrust on front axle is greater

FIG. 4 (right). Effect of king pin offset on turning radius and particularly on off-tracking



Figuring FIFTH WHEEL KINGPIN OFFSET

DETERMINATION of the proper extent of kingpin offset for tractor-semi-trailers by trial and error methods too often results in costly errors and is fraught with many difficulties. By the term "kingpin offset" is meant the longitudinal distance from the center of the tractor rear axle or bogie trunnion to the kingpin center, zero offset being where the kingpin is centered over the axle or trunnion. The amount of this offset affects a surprising number of characteristics of the combination, including load distribution, steering, braking, tire wear, riding qualities, maneuverability, traction, safety and overall length. The ex-

tent of offset affects some of these considerations favorably and some unfavorably and, consequently, the optimum offset is not easy to find.

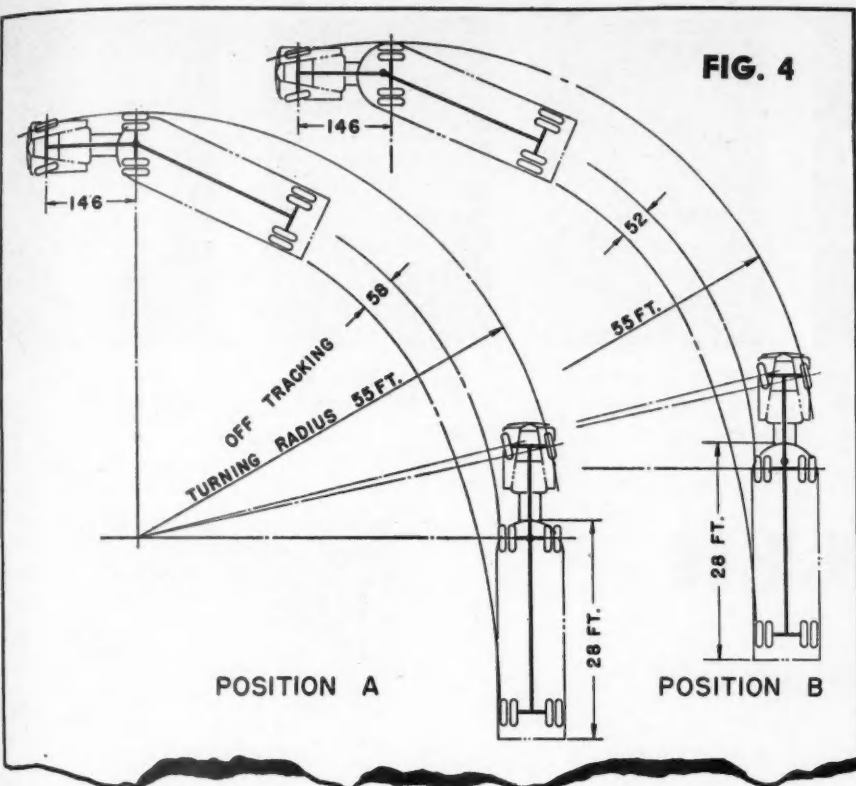
Indications point strongly to the desirability of sharply increasing the amount of kingpin offset beyond prevailing practice and to the possibility of higher plate heights compatible with reasonably low height of flat body floors. To accomplish these ends, a certain amount of development work is required in the design of both tractors and trailers.

Regardless of the relative desirability of different amounts of kingpin offset, there are definite geometric limits on how far ahead of the

tractor axle the kingpin may be placed. Before exploring these limitations, however, it is well to consider the general effects:

Load Distribution

FIRST among these is that of load distribution. Although the semi-trailer has other advantages, maximum load capacity within legislative restrictions is by far the most important reason for its widespread use. Although weight limitations are prescribed in a variety of ways in the various states, axle weight limit is predominant. For the maximum gross weight, obviously each axle must bear as nearly as possible the



Load distribution, traction, braking, steering and maneuverability are all affected by fifth wheel location. Here are the factors involved together with the limitations imposed

by MERRILL C. HORINE*
Mack Manufacturing Corp.

maximum allowable weight. With uniform tires all around, this requires that in the conventional three-axle combination, 20 per cent of the gross weight shall be borne by the tractor front axle and 40 per cent by each of the other two.

Because of the variation in unladen tractor weight and its distribution between tractor axles, it is obvious that to secure this ideal weight distribution will require different kingpin offsets for various individual combinations. In the case of a particular tractor rated for 40,

000 lb GTW and having an unladen weight, with fifth wheel lower half of 7750 lb., distributed 54 per cent on the front axle and 46 per cent on the rear, and a wheelbase of 146 in., the kingpin load of 19,250 lb. must be located 36½ in. ahead of the rear axle to secure 18,000 lb. on the rear axle and 9000 lb. on the front.**

** All weights in pounds. These values are determined by the formula:

$$KO = \frac{TC_r - WC_r}{TC_c - WC_c} \times WBC$$

Where KO is the kingpin in inches

TC_r is the tire capacity, front wheels, in pounds

TC_c is the tire capacity, tractor chassis, total, in pounds

WC_r is the tractor chassis weight on front tires, in pounds

WC_c is the tractor chassis weight, total, in pounds

WBC is the tractor chassis wheelbase

In individual cases, with different tractor weights, wheelbases and distribution of unladen weight, this figure will vary somewhat, but in every case the ideal of uniform tire loading throughout will be found impracticable of attainment with present design. Nevertheless, this demonstrates that from the standpoint of load distribution, the maximum practicable kingpin offset is desirable.

As will appear later, a considerably more moderate offset—approximately 14 in.—is the maximum which can be tolerated with prevailing tractors and trailers. This falls short of the ideal distribution, as indicated in Fig. 1, but it does offer an appreciable gain in GTW over that which is obtained with the kingpin centered over the tractor axle or offset to any lesser extent. The top drawing in Fig. 1 shows the distribution in pounds with the kingpin centered over the axle. The second shows the result of offsetting the kingpin 14 in., but making no other changes. The third represents the effect of moving the trailer axle back in appropriate amount to agree with the 14-in. offset so as to secure 18,000 lb. on both the tractor rear axle and the trailer axle. The difference between 5790 lb. on the front axle and the ideal of 9000 lb. represents the unavoidable discrepancy between the optimum and the maximum.†

(TURN TO PAGE 122, PLEASE)

† These values are determined by the formulas:

$$GC_r = \frac{(GC_c - WC_c) \times KO}{WBC - KO} + WC_r$$

$$GTW = GT_r + GC_r + GC_t$$

$$GT_t = \frac{WBC \times (GC_c - WC_c)}{WBC - KO}$$

$$KCG = \frac{BL}{2} - BO_k$$

$$WBT = \frac{(GT_t - WT_t) \times KCG}{(GT_c - WBC)} - KCG$$

When the gross weight on the tractor and trailer rear axles is set, with no kingpin offset, and then the kingpin is moved forward, the following applies:

Find GT_t from the above formula, leaving KO = 0:

$$GC_r = \frac{(WBC - KO) \times GT_t}{WBC} + WC_r$$

$$GC_t = \frac{GT_t \times KO}{WBC} + WC_t$$

$$GTW = GC_r + GC_t + GT_r$$

Where BL is the body length in inches

BO_k is the body overhang ahead of kingpin in inches

GC_r is the gross weight of tractor on front tires

GC_c is the gross weight of tractor on rear tires

GT_t is the gross weight of trailer at kingpin

GT_r is the gross weight of trailer on rear tires

GTW is the gross train weight

KCG is the distance from the center of gravity to the kingpin, in inches

KO is the kingpin offset, in inches

WBC is the wheelbase of tractor, in inches

WBT is the distance from kingpin to trailer rear axle, in inches

WC_r is the weight of tractor chassis, on front tires

WC_c is the weight of tractor chassis, on rear tires

WT_t is the weight of trailer, at kingpin

* Excerpted from a paper presented at the SAE Annual Meeting in Detroit, Jan. 12-16.



L. C. Allman,
Fruehauf Trailer Co.



P. D. McLean,
Highway Users Conf.



Chas. W. Kynoch,
Detroit Arsenal



Ed. J. Buhner,
President, ATA



E. J. Lucas
Kingham Trailer Co.

TRAILER

Makers Discuss:

1. Standardization of Connectors
2. Brake Operating Devices
3. Future of Highway Transport
4. Highway Planning and Courtesy



President Harrison Rogers
Rogers Brothers Corp.

V ELECTRICAL CONNECTORS for trailers and brake systems got the play at the engineering roundtable held in connection with the seventh annual convention of the Truck-Trailer Manufacturers Association at Edgewater Park, Miss., Jan. 12-14. At the general sessions prominent speakers discussed problems of interest to trailer users and manufacturers.

A proposed TTMA standard for truck-trailer and semi-trailer electrical connectors was submitted for adoption by the Specification Standardization Committee. The purpose of the standard is to bring about uniformity of installation and interchangeability of vehicles so as to eliminate the necessity of changing wiring each time a different powered vehicle is coupled to a towed vehicle. It is not the intent to favor the product of one manufacturer over that of another but to create uniformity of dimensions so that any plug will fit any coupler.

After a discussion of the subject it was decided to rewrite the proposed standard and submit it to members for a mail ballot. The specification standards will include approximate location of the coupler, diameter of the plug and spacing of its six sockets, diameter of the six-strand rubber-coated cable and its minimum load capacity.

Room for Brake Improvement

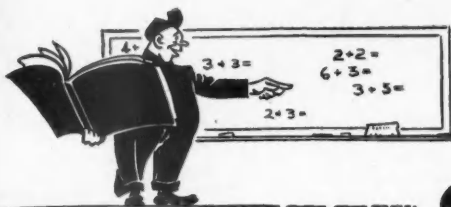
IT was generally agreed that there was room for improvement in brake operating devices to get better synchronization of tractor and trailer brakes. James J. Black, vice president in charge of engineering, Trailmobile, thought that truck manufacturers should pay more attention to the brake operating devices they place on truck models which are also used as tractors. Too often, he said, a braking problem is dumped into the lap of the trailer manufacturer that has its ori-

gin in the inadequacy of the power unit's braking system.

Homer T. Seale, of Homer T. Seale, Inc., Los Angeles, revealed some interesting results of a cooperative effort involving air brakes. When his company entered the compressed air brake field it offered its facilities to truck-trailer operators for experimental and research purposes. There have been some interesting developments.

One operator presented a problem in two-way check valves used where lines from hand and foot valves join. This operator had experienced a centering of the mechanism when the valve received air from both hand and foot valves simultaneously, thereby prohibiting air flow to brake-operating valves. To solve this problem a two-way check valve was designed which may receive air from either hand or foot valve or both and which has no position in which the air flow

(TURN TO PAGE 220, PLEASE)



CCJ QUIZ



There was a young chap from Hoboken
Who wrote poems in meter that's broken.
His efforts at verse
Went from awful to worse
Till one day he happened to choken.

So, if you don't choke over some of the atrocious rhymes here, you can try your skill at identifying the TRUCK in each jingle. All the correct answers are listed below, plus as many wrong answers just to make things a little tougher. Check page 138 for the answers. A score of six correct is passable. Seven is fair and eight is good. Nine is getting out of this world, and if you get all ten right, you should quit your job and concentrate on "Miss Hush" contests.

1.

A not so young man up in Lansing,
At his favorite magazine glancing,
Saw his initial success
On the cover no less
And found it was mighty entrancing.

2.

This truck is a gem—
It's very well built.
Your score will still count.
Even though it shows "Tilt."

3.

Young Henry from way up in Michigan
Once said, "Gee, but I wish I can!"
He didn't wish long
For it came like a gong
And old Dobbin he never did hitch ag'in.

4.

Queen on the Hit Parade,
To the top every time it will go—
Number one song that they're singing,
"Let it snow; let it snow; let it snow."

5.

This outfit was started in days ante-
bellum—
The answer you must guess for it's sure
we won't tellum.
It built carriages fine for your lady and
mine,
But now it is trucks
That are making the bucks
As they roll down the assembly line.

6.

Take a ride in a steamer with Stanley,
so manly,
But he's not the one of our choice.
We'll take the other, though lacking in
color,
And we know we could have done
"woise."

7.

Great oaks from "Little" acorns grow;
Find the clue and the answer you'll know.

8.

For a truck
That is stuck
In the muck
Or on ice
It is nice
To have twice
As much drive
As you strive
To arrive
Back in place
In the race
And save face.

9.

Said Horace to John,
"A truck, we have made it."
Said John back to Horace,
"For a job then let's rate it."

10.

There was a ferocious bull puppy;
On the front of a truck he stood, uppy,
But biting he wasn't
And barking he doesn't
And that ends our Quiz quite abrupt'ly,

Now find the answers on this list:

Autocar	International
Biederman	Kenworth
Chevrolet	Mack
Corbitt	Peterbilt
Diamond T	Reo
Dodge	Sterling
Federal	Studebaker
Ford	Walter
FWD	Ward LaFrance
GMC	White

1948 Quaker Package Delivery Body



Atlas Body & Equipment Co., Philadelphia, Pa., announces its 1948 models of Quaker Package delivery bodies. These bodies are made to mount on flat face cowl chassis from 1/2 ton to 5 ton units.

The bodies are of all steel construction incorporating the latest technique of high tensile steel welding—assuring less dead weight yet giving the strength of a sturdy steel structure.

New features of the 1948 line are the elimination of separately attached drip moulding, this has now been made an integral part of the roof. Panels and rear quarter panels are riveted so that repairs can be made quickly without costly tie-ups of equipment. Drivers seats are made of newly designed stretcher coil spring covered with attractive leather. Drivers section and body is covered with 12 gage safety tread steel plate.

The Quaker package bodies are available with insulation for the frozen food trade, and for the milk industry. Also lined with steel slats or plywood for regular package delivery.



**Diesel Smoke Problems Aired at SAE . . . Dodge Prices Up 8 to 12% . . . Ford Up Average of 5.6%
Chilly Torque Converters . . . 10% Rate Increase for East Coast . . . First Taft-Hartley Injunction**

Diesel Smoke Aired at SAE

Fleet operators who use diesel trucks know that the smoke problem is a rather serious one. At the annual SAE meeting in Detroit the engineers gave the problem a good working over and devoted no less than six papers to the subject. Their discussion was rather technical, and when we couldn't keep up with the confusion of curves and graphs and engineering lingo in general we corralled P. H. Schweitzer, of Pennsylvania State College, chairman of the session, who is considered an authority on the subject.

He pointed out that the problem requires three methods of attack—the technical approach, education, and law enforcement. He said currently police in Los Angeles run around armed with a smoke chart and when they see an offending diesel they hold the chart up to the sky and compare various sections of it with the smoke coming from the stack. If the comparison shows too heavy a density, the driver is hauled before a regulating body which may impose a fine as high as \$200. However, in most cases the operator is given an opportunity to correct the condition.

Contributing factors toward excessive smoking, according to Mr. Schweitzer, are fuel injection and bad driving habits. He added that at the outset the unions would not permit discharging a driver for improper driving or tampering with the fuel adjustment, but that they now will allow the discharge. He said that even the best diesel would smoke when crowded and that drivers paid on the basis of so many hours per run often are offenders in that respect. He also pointed out that smoke from gasoline engines is more toxic and dangerous than diesel fumes, but are not so conspicuous and thus do not attract public attention. It is his opinion that the operators and manufacturers are making progress and the diesel smoke problem eventually will be brought under control.

Dodge Prices Up 8 to 12%

Although only a few prices were available in mid-January, those that could be obtained indicate an increase of between 8 and 12 per cent on the new greatly improved Dodge truck models. Following are prices of a few models which were available. Factory retail price at the factory

by LEN WESTRATE

CCJ Detroit News Editor

without taxes or other charges: $\frac{1}{2}$ -ton 6 $\frac{1}{2}$ ft. box, \$1113; $\frac{3}{4}$ -ton chassis cab 7 $\frac{1}{2}$ ft. express body, \$1221; 1-ton chassis, cab, 7 $\frac{1}{2}$ ft. express body, \$1277; 1 $\frac{1}{2}$ -ton chassis, cab, and 9 ft. stake body, single rear tires, \$1491; 2-ton chassis, cab, stake body, dual rear tires, \$1858, and the 4-wheel drive 1-ton power wagon with chassis cab and express body, \$1814.

Ford Up Average of 5.6%

Prices on the new Ford truck line are up an average of 5.6 per cent over the level prevailing for previous models. The list prices of the F-7 2 $\frac{1}{2}$ -ton and the F-8 3-ton, which are new large sizes, range from \$2485 to \$3430. New prices on the regular models which were made previously range from \$890 for the F-1 6-cylinder $\frac{1}{2}$ -ton chassis and cowl to \$2135 for the F-6 series cab-over-engine 2-ton 8-cylinder stake truck. The company stresses that while prices are up somewhat, additional value has been built into the units and is not fully reflected in the price increase. (All Ford prices are published in the CCJ Specification Tables beginning on page 77 of this issue.)

Chilly Torque Converters

Truck owners who are looking for adoption of torque converters by truck manufacturers will be interested in the experience of Detroit's street railway which has several hundred buses equipped with the device. It has housing for only 250 of the units and in cold weather it is required to start the buses several times during the night to keep the oil in the system warmed up in order to prevent trouble when trying to start out in the morning. The D.S.R. also has found that it must house all its diesel buses if it wants to be able to start them on cold mornings.

10% Rate Increase in East

With costs soaring, motor freight carriers from the East Coast to the Rockies got a badly needed 10 per cent increase on interstate rates during the early days of this

year. However, it is the feeling of many operators in the Detroit area that another increase will be necessary to bring operating ratios up to a satisfactory level. With costs mounting, many carriers who had been operating at a reasonable profit now find themselves with 99 per cent or higher ratios. One particular company had a 92 per cent ratio up to the time of the last wage increase in November and within three months had gone up to more than 99 per cent. Current truck rates still are 17 $\frac{1}{2}$ per cent under railroad rates on loads of 5000 pounds or more, which not only affects uniform transportation costs for shippers but also makes too great a disparity.

One fleet operator made an interesting suggestion in the discussion following presentation of a paper on the interval between preventive maintenance procedure at the SAE annual meeting in Detroit. He said that truck and bus manufacturers should provide some means of centralizing lubrication for trucks and buses. Another interesting point brought out was that while P.M. procedures in themselves are valuable, their worth is greatly reduced unless the operating department will release the trucks for inspection.

Taft-Hartley Injunction

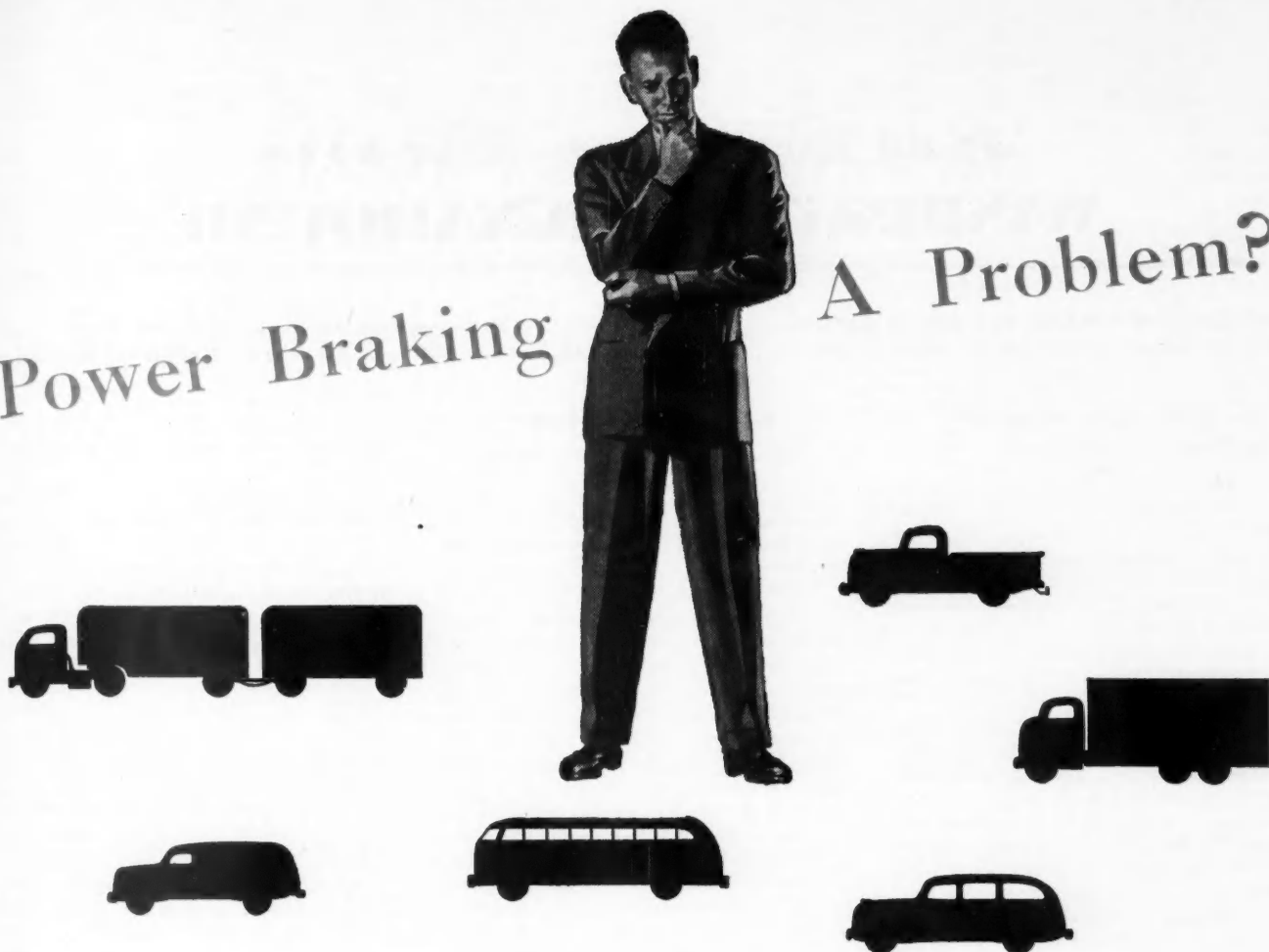
The first injunction of its kind under the Taft-Hartley law against featherbedding has been handed down by a U. S. court in Utica, N. Y., against the Albany teamsters' local. The ruling orders the local to refrain from secondary boycotts and demanding pay for work not done. The action grew out of a strike against Montgomery-Ward in which leaders of the union were charged with persuading individual truck operators and drivers to refuse to handle shipments to and from the company's plant at Menands, N. Y.

Fruehauf Move Rumor

Reports persist in Detroit that Fruehauf Trailer Co. is planning to move its headquarters from Detroit to Cleveland. Some substance was given to the reports recently when Hudson Motor Car Co. purchased approximately 200,000 sq. ft. of factory space from Fruehauf. It also is known that negotiations to lease some of the Detroit Fruehauf office space are under way.

(TURN TO PAGE 144, PLEASE)

Power Braking A Problem?



Hydrovac is the Answer

FOR EVERY SIZE VEHICLE FROM THE SMALLEST TO THE LARGEST

Hydrovac*—the Bendix-developed hydraulic-vacuum braking system—has proved to be the economical way to finer braking on all types of vehicles. This unique line of units is designed for engineering simplicity, and fits into any hydraulic system with only three connections. Their capacities range from station-wagons all the way to heavy tandem-axle liners. Nearly two

million installations and literally billions of miles have proved Hydrovac's efficiency, economy, and long life. Investigate Hydrovac! It's the answer to almost any power braking problem.

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WASHINGTON RUNAROUND

New Federal Vehicle Committee Gets Results First Year . . . Transportation Study Bugged Down . . . ICC Revised Safety Draft Due Soon . . . Two Year Limitation Bill . . . Federal Highway Roundup

Federal Vehicle Committee Gets Results First Year

Slashing through government red tape at a furious pace in an effort "to improve motor equipment management throughout the Federal Government," the Interdepartmental Motor Equipment Committee after its first year of actual operation can point to several concrete accomplishments which, when made available publicly, should prove of inestimable value to commercial fleet operators.

COMMERCIAL CAR JOURNAL, after an interview with W. A. McCutcheon, Budget Bureau staff member and chairman of the interdepartmental group, can report that the work of this group is so intensive that some of the results may become standard practice throughout the trucking industry when they are released.

In addition to Mr. McCutcheon, the committee is made up of the following: James Scammahorn, Wm. K. Knauff, Agriculture; Lt. Col. T. R. Hikel, Air Force; Col. W. J. Crowe, Army; Clarence S. Bruce, Commerce; Oscar C. Wiederhold, Federal Works Agency; M. A. Stephens, Federal Security Agency; C. C. Davison, Interior; A. W. Corthell, Justice; Commander N. M. Martinsen, Navy; Albert G. Biedenweg, Post Office; Chas. C. Hudson, TVA; John D. Larson, Treasury; I. J. Henderson, Veterans Administration. However, the work of this small group affects all Federal vehicles, totaling about 73,000 (excluding military), of which approximately 52,000 are trucks.

The two top priority projects now underway should be of considerable interest to fleet owners. The first of these is the promulgation of a replacement standard for vehicles. The committee has already worked out such a standard for passenger automobiles which would permit replacement after six years or 60,000 miles of operation. If this proposal is approved the Committee will limit the number of vehicles that may be replaced during the first four years to 25 per cent of the total. A replacement standard for trucks is being prepared and should be available well before the end of the year. These standards are based on operating experience and other similar data gathered from the hundreds of government vehicle installations throughout the United States as well as industrial users.

The other major project is the preparation of a general standardized preventive maintenance manual. This manual will be

by GENE HARDY
CCJ Washington News Bureau

drawn up in such a manner so as to assure flexibility of use under various field conditions.

As to the concrete results recorded as a result of this cooperative effort, perhaps the most interesting to fleet owners is the adoption of a standard cost and reporting system. This system has resulted in the compilation of the first annual report covering all Federal vehicles. This report, not yet released, covers all government agencies and includes the following data for each agency as well as cumulative totals on automobiles, buses, and 10 classes of trucks:

Miles operated; hours operated; gallons of fuel used; accumulated hours operated; accumulated miles operated; accumulated maintenance costs; operating costs (less storage and depreciation); maintenance costs; tire and tube renewal costs; total operating and maintenance costs; cost per mile; cost per hour; miles per gallon of fuel; gallons of fuel per hour.

Other concrete accomplishments include:

1—The establishment of a central clearing point for the interchange of technical information on equipment. All such material comes to Mr. McCutcheon, who, with the assistance of the Committee, passes it along to other agencies and goes to work in a trouble-shooting capacity if necessary.

2—Consolidation of government shops, so as to eliminate duplication of maintenance and repair facilities in a particular area. This has been done in several instances with the full cooperation of local advisory groups. This project will continue indefinitely.

3—A standard system of identification for Federal vehicles has also been adopted.

Other projects underway include a vehicle operator's training program and standardization and simplification of forms used in motor equipment management.

Transport Study Bugged

The transportation investigation of the House Interstate and Foreign Commerce Committee is presently in a state of "suspended animation," according to Dr. John H. Frederick, committee analyst. Dr. Frederick told COMMERCIAL CAR JOURNAL that he had hoped the letters mailed by the Committee last September to selected associations would "bring forth specific sug-

gestions for legislative activity," but that there has not yet been "any great rushing in."

He further stated that the Committee intends to re-survey the replies from the first series of questionnaires and cull four or five specific suggestions for legislation looking toward revamping of the nation's transportation policy. He added that it is not likely that the Committee will issue another report in the near future.

Dr. Frederick also said that the Committee has been studying other aspects of transportation problems, including transportation in Alaska, which covers the much-discussed highway, and that a report on this subject will be issued soon.

ICC Revised Draft Soon

The ICC Motor Carrier Section of Safety expects to begin writing the second draft of the revised motor carrier safety regs before March 1. It is this draft which will be used as a basis for public hearings sometime later in the year.

Much of the Section's work has been concerned with reviewing all comments received at the series of informal conferences with carriers and other interested groups last fall. Also included in this review are briefs submitted by organizations which did not appear, as well as revisions of material already submitted.

Further slowing up the work is the fact that organization which had not made any statement on the subject continue to pop up and ask for further time in which to submit their views.

Two-Year Limitation Bill

The first bill to be given approval by the House of Representatives after the opening of the second session of the 80th Congress was H.R. 2759, which amends the Interstate Commerce Act to provide a two-year limitation within which actions may be brought by or against common carriers by motor vehicles, common carriers by water, and freight forwarders, and other common carriers for the recovery of undercharges and overcharges.

The bill was designed to establish a uniform statute of limitations for such action so as to end the confusion which has resulted from the application of the varying State statutes of limitations. The two-year period is the same time within which similar actions may be brought against common carriers by rail.

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Truck Specifications Table

OF CURRENT PRODUCTION MODELS

DATA SUPPLIED BY MANUFACTURERS AND TABULATED BY

COMMERCIAL CAR JOURNAL

Key to Definitions, References and Abbreviations

DEFINITIONS

MAKE AND MODEL

Only Domestic Truck Models are listed.

OPTIONAL UNITS

For the express purpose of best fitting the truck to the individual job most of the models listed can be provided with optional engines, transmissions, axles, etc., and these models when so equipped are considered standard stock models.

CHASSIS LIST PRICE

The chassis list price applies to the minimum standard wheelbase with standard tires and standard equipment. All prices are F.O.B. factory. Chassis list price does not include the price of the Cab unless otherwise noted.

RECOMMENDED GROSS VEHICLE WEIGHT FOR NORMAL SERVICE

The Gross Weights published herewith are those supplied by manufacturers as their Recommended Gross Vehicle Weights for Normal Operating Conditions, and are based upon the Maximum Authorized Tire Size listed. In actual practice the manufacturer may either increase or decrease the gross vehicle weight rating when either favorable or

unfavorable operating conditions are involved. Since the proper performance of a motor truck depends upon many factors, including grades, road conditions, etc., the gross weights that a manufacturer is prepared to recommend will vary with particular conditions, and the manufacturer's own standard of safety factors. Specific recommendations, therefore, should be obtained from the manufacturer's representative.

CHASSIS WEIGHT

The chassis weight listed includes the weight of the minimum standard wheelbase chassis, with cowl, with standard tires, with standard equipment, with crankcase and cooling system full, and 5 gallons of fuel in the tank. It does not include the weight of the Cab. This applies to C.O.E. as well as conventional chassis types. Exceptions are noted.

STANDARD TIRE SIZE

The standard tire size listed is that which is included in the Chassis List Price.

MAXIMUM AUTHORIZED TIRE SIZE

The tire size listed in this column is the maximum size recommended by the manufacturer of the chassis for the Gross Vehicle Weight for Normal Operating Conditions. It is furnished at extra cost, if it differs from the standard size. Dual rears are understood; exceptions noted.

MINIMUM STANDARD WHEELBASE

The minimum standard wheelbase is the so-called standard wheelbase on which the Chassis List Price is based.

MAXIMUM STANDARD WHEELBASE

The maximum standard wheelbase is the extreme end of the standard range of wheelbases offered by the chassis maker.

MAXIMUM BRAKE HP.

Maximum Brake Horsepower at Given R.P.M. is actual dynamometer reading without accessories.

GEAR RATIO RANGE

Gear Ratio Range in High—Ratios within the range given are available at no extra cost. Exceptions are noted.

TRACTORS

Unless given the designation (N)—meaning not available as a tractor—all standard models may be assumed to be available as tractors. Exclusively Tractor models are designated (T).

KEY TO REFERENCES

c.f.—Cab Forward design.

c.o.e.—Cab-Over-Engine design.

(D)—Diesel-engine equipped.

(T)—Designed for tractor use only.

(C)—Converted Ford or Chevrolet Model.

(2) International Harvester—Specifications shown represent only the basic standard chassis units and standard chassis ratings in keeping with definitions established by Commercial Car Journal. Optional units not shown such as engines, clutches, transmissions, axles or axle ratios, brakes, wheels and tires, frames or frame reinforcements, optional wheelbases or any other units which make up part of the truck chassis and which International will furnish and approve from the factory as optional equipment can or will change either the ratings, chassis weight shown or performance of the truck as indicated by this list.

Also the company reserves the privileges of assigning special gross vehicle ratings for any chassis providing in the opinion of its engineering department, the type of service justifies the new rating without decreasing the safety factor designed into the truck.

(a)—Available with "Two-Speed Axle" designated KBS Models.

KEY TO ABBREVIATIONS

MAKES—ALL

B—Bendix.
BL—Brown-Lipe.
Bu or Bud—Buda.
BW—Bendix-Westinghouse.
C—Chevrolet.
Cl or Cla—Clark.
Con—Continental.
Cum—Cummins-Diesel.
Eat—Eaton.
F—Ford.
Fu—Fuller.
H—Hotchkiss.
Her—Hercules.
L—Lockheed.
LH—Lockheed front, Wagner "hi-Tork" rear.
LW—Lockheed front, Wisconsin rear.
M—Midland.
N.P.—New Process.
O or Ow—Own.
Op or Opt—Optional.
Shu—Shuler.
Spi—Spicer.
T or Tim—Timken.
TW—Timken-Westinghouse.
TW—Timken-Wisconsin.
WQ—Warner Gear.
Wau—Waukesha.
W or Wis—Wisconsin.
We—Westinghouse.
WW—Westinghouse or Wagner.

WHEELS DRIVEN

2F—Forward unit of Rear Axle Group.
2R—Rear Unit of Rear Axle Group.
4R—Forward and rear units of Rear Axle Group.
6—All wheels.

BRAKES—SERVICE

Location

4—Four Wheels, front and rear.
4r—Four Wheels, rear only.

Type

I—Internal.
X—External.

Operation

A—Air.
H—Hydraulic.
V—Vacuum.
D or Dp—Dual Primary.

BRAKES—HAND

Location

C—Center of double propeller shaft.
2—Rear wheels.
4—Four wheels.
6—Six wheels.
P—Back of Power Divider.
J—Jackshaft.
T—Transmission.
F—Driveshaft.

Type

D—Tru-Stop disk.
I—Internal.
M—Mechanical.
X—External.
PD—Two drums on rear of power divider.

BRAKE DRUMS

Material

a—Cast alloy iron.
A—American Car Foundry.
c—Cast iron.
Cc—Composite Front, Cast Iron in rear.
Cl—Copper iron.
Co—Composite.
D—Dayton.
E—Ermalite.
G—Gunite.
N—Nickel iron.
S—Steel.

(Where a combination of any of the above is used, the first reference mark applies to the front and the second to the rear drums.)

FRAME

Type

C—Channel.
T—Channel tapered front and rear.
L—Channel reinforced with liner.
B—Channel reinforced with both liner and flangeplate.
P—Channel reinforced with plate.
TL—Channel tapered front and rear reinforced with liner.
D—Drop Center.
Tt—Tapered front.
A—Straight section sidemembers, lined with oak inserts.
Z—Reinforced (X) member frame, box type sections.

REAR AXLE

Final Drive and Type

B—Bevel.
CD—Chain Drive.
F—Full-floating.
H or Hy—Hypoid.
d—Dual range axle.
2—Double Reduction.
S—Spiral bevel.
W—Worm.
3/4—Three Quarters Floating.
3/2—Semi-Floating.
T—Torque Tube.

GEAR RATIOS

(**) Only one ratio.

Drive and Torque

H—Hotchkiss (springs).
R—Radius Rods.
L—Parallel Torque Rods.
T—Torque Arm.

GOVERNOR STANDARD

Y—Yes.
N—No.



Good-looking Studebaker trucks do a fine job of saving money for many a business!

EVERYWHERE you go these days, you find attractive-looking places of business. A trend toward clean-lined modernizing is sweeping the country.

Many firms now make looks a major consideration, even when they invest in a new motor truck. They take effective steps to reduce their hauling costs at the same time, when they buy Studebaker trucks.

Studebaker trucks have eye appeal

Superior operating economy is only one reason for the steadily growing popularity of today's rugged, powerful Studebakers.

Many a truck operator can tell you that you will find it good publicity for your business, when a handsome new Studebaker truck represents you on the streets and highways.

Pages could be filled with letters to this effect that Studebaker receives from enthusiastic owners. They're constantly being complimented by their customers on the attractive appearance of their trucks.

A "plus" that costs nothing extra

You don't pay a penny of premium for the distinction that comes with a gleaming new half-ton, one-ton or larger capacity Studebaker truck.

What's more, you get a vehicle solid and sound with the world's finest truck craftsmanship—brilliantly engineered—with every detail of its construction and performance exhaustively pre-tested on Studebaker's famed 800-acre, million-dollar proving ground.

A new Studebaker truck is certain to reward you with top-quality transportation. See your nearby Studebaker dealer now and plan with him on the model best suited to your requirements.

STUDEBAKER

Builder of trucks you can trust

The Studebaker Corporation, South Bend 27, Indiana, U. S. A.

Line Number	MAKE AND MODEL	WHEEL-BASE		TIRE SIZES		Chassis Weight (See definition)	Gross Vehicle Weight for Normal Service	ENGINE DETAILS		TRANSMISSION		REAR AXLE		FRONT AXLE	BRAKES			FRAME										
		Minimum Standard	Maximum Standard	Standard	Dual rear S-angle rear			No. of Cylinders	Displacement	Comp. Ratio	H.P. at R.P.M.	Main Bearings	Governor Standard		Make and Model	Forward Spds	Make and Model		Gear and Type	Drive & Torque	Range in High	Make and Model	Location	Linking Area	Drum Area	Drum Material	Hand Location	C-A Dimension (Min. Std. W. B.)	Side Rail Dimensions	Type
1	Dodge Cont'd	130	190	21000	8.25/20-4	10,00/20	Own T-158	6-3x4x5	331.6	6.27/0.128	3000-7	3x11.2	Y.N.P. 38110	5-Tim L-300	5-Tim L-300	424	041HV	H 5.6-6.8	6.3-9.1	Tim 32516A1	041HV	424	666C	666C	TX	60	14x3x10	CO
2	B-1-TA	130	190	23000	10.00/20	11,00/20	Own T-158	6-3x4x5	331.6	6.27/0.128	3000-7	3x11.2	Y.N.P. 38110	5-Tim L-300	5-Tim L-300	424	041HV	H 5.6-6.8	6.3-9.1	Tim 32516A1	041HV	424	666C	666C	TX	60	14x3x10	CO
3	B-1-TA	130	190	23000	10.00/20	11,00/20	Own T-158	6-3x4x5	331.6	6.27/0.128	3000-7	3x11.2	Y.N.P. 38110	5-Tim L-300	5-Tim L-300	424	041HV	H 5.6-6.8	6.3-9.1	Tim 32516A1	041HV	424	666C	666C	TX	60	14x3x10	CO
4	School B-1-FS-152	152	170	15000	6.50/20	7,50/20	Own T-148	6-3x4x4	236.6	6.192/0.109	3600-4	2x5.054	N.N.P. 39670	4-Own T-148	4-Own T-148	336	041HV	H 5.6-6.8	5.6-6.8	Own T-148	041HV	336	479Co	479Co	TX	59	21x2x7	CO
5	Dodge B-1-FS-152	170	170	15000	6.50/20	7,50/20	Own T-148	6-3x4x4	236.6	6.192/0.109	3600-4	2x5.054	N.N.P. 39670	4-Own T-148	4-Own T-148	336	041HV	H 5.6-6.8	5.6-6.8	Own T-148	041HV	336	479Co	479Co	TX	59	21x2x7	CO
6	B-1-FS-192	192	192	15000	7.50/20	8,25/20	Own T-148	6-3x4x4	236.6	6.192/0.109	3600-4	2x5.054	N.N.P. 39670	4-Own T-148	4-Own T-148	336	041HV	H 5.6-6.8	5.6-6.8	Own T-148	041HV	336	479Co	479Co	TX	59	21x2x7	CO
7	B-1-FS-212	212	212	17000	7.50/20	8,25/20	Own T-150	6-3x4x4	250.6	6.204/0.114	3600-4	2x5.054	N.N.P. 38910	5-Own T-150	5-Own T-150	396	041HV	H 6.2-7.1	6.2-7.1	Own T-150	041HV	396	553C	553C	TX	70	10x3x10	CO
8	B-1-FS-229	229	229	19000	8.25/20	9,00/20	Own T-156	6-3x4x4	251.6	6.225/0.115	3200-7	3x11.2	Y.N.P. 38110	5-Tim H100DPH	5-Tim H100DPH	420	041HV	H 6.2-7.1	6.2-7.1	Own T-156	041HV	420	609C	609C	TX	70	10x3x10	CO
9	Duplex	136	220	18000	8.25/20	9,00/20	Her JXD	6-3x4x4	320.6	6.240/0.123	3000-7	2x10.10	Y.Fu 5B330	5-Tim H100	5-Tim H100	420	041HV	H 6.2-7.1	6.2-7.1	Own T-156	041HV	420	654A	654A	TX	59	9x3x3x5	CO
10	Duplex	136	220	18000	8.25/20	9,00/20	Her JXD	6-3x4x4	320.6	6.240/0.123	3000-7	2x10.10	Y.Fu 5B330	5-Tim H100	5-Tim H100	420	041HV	H 6.2-7.1	6.2-7.1	Own T-156	041HV	420	654A	654A	TX	59	9x3x3x5	CO
11	Duplex	136	220	18000	8.25/20	9,00/20	Her JXD	6-3x4x4	320.6	6.240/0.123	3000-7	2x10.10	Y.Fu 5B330	5-Tim H100	5-Tim H100	420	041HV	H 6.2-7.1	6.2-7.1	Own T-156	041HV	420	654A	654A	TX	59	9x3x3x5	CO
12	Duplex	136	220	18000	8.25/20	9,00/20	Her JXD	6-3x4x4	320.6	6.240/0.123	3000-7	2x10.10	Y.Fu 5B330	5-Tim H100	5-Tim H100	420	041HV	H 6.2-7.1	6.2-7.1	Own T-156	041HV	420	654A	654A	TX	59	9x3x3x5	CO
13	Duplex	136	220	18000	8.25/20	9,00/20	Her JXD	6-3x4x4	320.6	6.240/0.123	3000-7	2x10.10	Y.Fu 5B330	5-Tim H100	5-Tim H100	420	041HV	H 6.2-7.1	6.2-7.1	Own T-156	041HV	420	654A	654A	TX	59	9x3x3x5	CO
14	Duplex	136	220	18000	8.25/20	9,00/20	Her JXD	6-3x4x4	320.6	6.240/0.123	3000-7	2x10.10	Y.Fu 5B330	5-Tim H100	5-Tim H100	420	041HV	H 6.2-7.1	6.2-7.1	Own T-156	041HV	420	654A	654A	TX	59	9x3x3x5	CO
15	Duplex	136	220	18000	8.25/20	9,00/20	Her JXD	6-3x4x4	320.6	6.240/0.123	3000-7	2x10.10	Y.Fu 5B330	5-Tim H100	5-Tim H100	420	041HV	H 6.2-7.1	6.2-7.1	Own T-156	041HV	420	654A	654A	TX	59	9x3x3x5	CO
16	Federal	1895	146	13500	4.60/20-8	7,50/20	Her JXDF	6-3x4x4	245.6	6.180/0.107	3000-7	2x10.10	W.G.T. 9	4-Tim 53547DPH	4-Tim 53547DPH	310	041HV	H 6.2-7.1	6.2-7.1	Own T-156	041HV	310	482A	482A	TX	67	8x2x7	CO
17	Federal	1895	146	13500	4.60/20-8	7,50/20	Her JXDF	6-3x4x4	245.6	6.180/0.107	3000-7	2x10.10	W.G.T. 9	4-Tim 53547DPH	4-Tim 53547DPH	310	041HV	H 6.2-7.1	6.2-7.1	Own T-156	041HV	310	482A	482A	TX	67	8x2x7	CO
18	Federal	1895	146	13500	4.60/20-8	7,50/20	Her JXDF	6-3x4x4	245.6	6.180/0.107	3000-7	2x10.10	W.G.T. 9	4-Tim 53547DPH	4-Tim 53547DPH	310	041HV	H 6.2-7.1	6.2-7.1	Own T-156	041HV	310	482A	482A	TX	67	8x2x7	CO
19	Federal	1895	146	13500	4.60/20-8	7,50/20	Her JXDF	6-3x4x4	245.6	6.180/0.107	3000-7	2x10.10	W.G.T. 9	4-Tim 53547DPH	4-Tim 53547DPH	310	041HV	H 6.2-7.1	6.2-7.1	Own T-156	041HV	310	482A	482A	TX	67	8x2x7	CO
20	Federal	1895	146	13500	4.60/20-8	7,50/20	Her JXDF	6-3x4x4	245.6	6.180/0.107	3000-7	2x10.10	W.G.T. 9	4-Tim 53547DPH	4-Tim 53547DPH	310	041HV	H 6.2-7.1	6.2-7.1	Own T-156	041HV	310	482A	482A	TX	67	8x2x7	CO
21	Federal	1895	146	13500	4.60/20-8	7,50/20	Her JXDF	6-3x4x4	245.6	6.180/0.107	3000-7	2x10.10	W.G.T. 9	4-Tim 53547DPH	4-Tim 53547DPH	310	041HV	H 6.2-7.1	6.2-7.1	Own T-156	041HV	310	482A	482A	TX	67	8x2x7	CO
22	Federal	1895	146	13500	4.60/20-8	7,50/20	Her JXDF	6-3x4x4	245.6	6.180/0.107	3000-7	2x10.10	W.G.T. 9	4-Tim 53547DPH	4-Tim 53547DPH	310	041HV	H 6.2-7.1	6.2-7.1	Own T-156	041HV	310	482A	482A	TX	67	8x2x7	CO
23	Federal	1895	146	13500	4.60/20-8	7,50/20	Her JXDF	6-3x4x4	245.6	6.180/0.107	3000-7	2x10.10	W.G.T. 9	4-Tim 53547DPH	4-Tim 53547DPH	310	041HV	H 6.2-7.1	6.2-7.1	Own T-156	041HV	310	482A	482A	TX	67	8x2x7	CO
24	Federal	1895	146	13500	4.60/20-8	7,50/20	Her JXDF	6-3x4x4	245.6	6.180/0.107	3000-7	2x10.10	W.G.T. 9	4-Tim 53547DPH	4-Tim 53547DPH	310	041HV	H 6.2-7.1	6.2-7.1	Own T-156	041HV	310	482A	482A	TX	67	8x2x7	CO
25	Federal	1895	146	13500	4.60/20-8	7,50/20	Her JXDF	6-3x4x4	245.6	6.180/0.107	3000-7	2x10.10	W.G.T. 9	4-Tim 53547DPH	4-Tim 53547DPH	310	041HV	H 6.2-7.1	6.2-7.1	Own T-156	041HV	310	482A	482A	TX	67	8x2x7	CO
26	Federal	1895	146	13500	4.60/20-8	7,50/20	Her JXDF	6-3x4x4	245.6	6.180/0.107	3000-7	2x10.10	W.G.T. 9	4-Tim 53547DPH	4-Tim 53547DPH	310	041HV	H 6.2-7.1	6.2-7.1	Own T-156	041HV	310	482A	482A	TX	67	8x2x7	CO
27	Federal	1895	146	13500	4.60/20-8	7,50/20	Her JXDF	6-3x4x4	245.6	6.180/0.107	3000-7	2x10.10	W.G.T. 9	4-Tim 53547DPH	4-Tim 53547DPH	310	041HV	H 6.2-7.1	6.2-7.1	Own T-156	041HV	310	482A	482A	TX	67	8x2x7	CO
28	Federal	1895	146	13500	4.60/20-8	7,50/20	Her JXDF	6-3x4x4	245.6	6.180/0.107	3000-7	2x10.10	W.G.T. 9	4-Tim 53547DPH	4-Tim 53547DPH	310	041HV	H 6.2-7.1	6.2-7.1	Own T-156	041HV	310	482A	482A	TX	67	8x2x7	CO
29	Federal	1895	146	13500	4.60/20-8	7,50/20	Her JXDF	6-3x4x4	245.6	6.180/0.107	3000-7	2x10.10	W.G.T. 9	4-Tim 53547DPH	4-Tim 53547DPH	310	041HV	H 6.2-7.1	6.2-7.1	Own T-156	041HV	310	482A	482A	TX	67	8x2x7	CO
30	Federal	1895	146	13500	4.60/20-8	7,50/20	Her JXDF	6-3x4x4	245.6	6.180/0.107	3000-7	2x10.10	W.G.T. 9	4-Tim 53547DPH	4-Tim 53547DPH	310	041HV	H 6.2-7.1	6.2-7.1	Own T-156	041HV	310	482A	482A	TX	67	8x2x7	CO
31	Federal	1895	146	13500	4.60/20-8	7,50/20	Her JXDF	6-3x4x4	245.6	6.180/0.107	3000-7	2x10.10	W.G.T. 9	4-Tim 53547DPH	4-Tim 53547DPH	310	041HV	H 6.2-7.1	6.2-7.1	Own T-156	041HV	310	482A	482A	TX	67	8x2x7	CO
32	Federal	1895	146	13500	4.60/20-8	7,50/20	Her JXDF	6-3x4x4	245.6	6.180/0.107	3000-7	2x10.10	W.G.T. 9	4-Tim 53547DPH	4-Tim 53547DPH													



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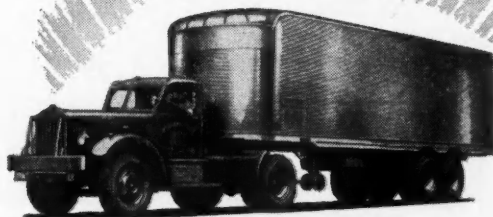
Line Number	MAKE AND MODEL	Chassis List Price	WHEEL-BASE		Gross Vehicle Weight for Normal Service	(See definition)	TIRE SIZES		Model	ENGINE DETAILS				TRANSMISSION		REAR AXLE		FRONT AXLE	BRAKES				FRAME			
			Minimum	Maximum			No. of Cylinders	Stroke		Displacement	Comp. Ratio	Torque lb. ft.	H.P. at R.P.M.	Green	Number, Main Bearings	Governor Standard	Model		Make and Model	Forward Spds	Model	Gear and Type		Drive & Torque	Range Ratio High	Model	Make and Model	Hand Location	C-A Dimension (Min. Std. W. B.)	Side Rail Dimensions
1	Studebaker Cont'd		128	128	10000	3060/7.50/178	7.00/20		Own 2M	6-3 1/2 x 4 1/2	1706.6	5.134	80-4000	4-2 1/2 x 5 1/2	N/Own 673074	4/Own 665174	SF	H 6.00-5.83	Own 67461	LH41H	216	342a	TX	60 1/2 x 3 1/2 x 1 1/2	T	
2	M1A-28	128	128	128	10000	3060/7.50/178	8.25/20		Own 3M	6-3 1/2 x 4 1/2	2266.6	5.176	91-3000	4-2 1/2 x 5 1/2	N/Own 674989	4/Own 665171	SF	H 6.13-5.10	Own 664452	LH41H	280	442 Co	TX	60 1/2 x 3 1/2 x 1 1/2	T	
3	M1B-28	128	128	10000	3060/7.50/178	8.25/20		Own 3M	6-3 1/2 x 4 1/2	2266.6	5.176	91-3000	4-2 1/2 x 5 1/2	N/Own 674989	4/Own 665171	SF	H 6.13-5.10	Own 664452	LH41H	280	442 Co	TX	60 1/2 x 3 1/2 x 1 1/2	T		
4	Truckall(C) F18-5	140	194	18500	4536/5.70/20	9.00/20		Ford	8-3 1/2 x 5 1/2	239.6	4.180	100-3800	3-2 1/2 x 4 1/2	N/Ford 81250	12/Cla R1250	SF	H 5.67-6.83	Ford	L41HV	390	600a	TX	65 1/2 x 3 1/2 x 4 1/2	CTT		
5	(C) F18-5	140	194	18500	4536/5.70/20	9.00/20		Ford	8-3 1/2 x 5 1/2	239.6	4.180	100-3800	3-2 1/2 x 4 1/2	N/Ford 81250	12/Cla R1250	SF	H 5.67-6.83	Ford	L41HV	390	600a	TX	65 1/2 x 3 1/2 x 4 1/2	CTT		
6	(C) F18-5	140	194	18500	4536/5.70/20	9.00/20		Ford	8-3 1/2 x 5 1/2	239.6	4.180	100-3800	3-2 1/2 x 4 1/2	N/Ford 81250	12/Cla R1250	SF	H 5.67-6.83	Ford	L41HV	390	600a	TX	65 1/2 x 3 1/2 x 4 1/2	CTT		
7	(C) F18-5	140	194	18500	4536/5.70/20	9.00/20		Ford	8-3 1/2 x 5 1/2	239.6	4.180	100-3800	3-2 1/2 x 4 1/2	N/Ford 81250	12/Cla R1250	SF	H 5.67-6.83	Ford	L41HV	390	600a	TX	65 1/2 x 3 1/2 x 4 1/2	CTT		
8	Ward La Fr. D-1A	5340	149	27000	9500/10.00/20	11.00/20		Con B2427	6-4 1/2 x 5 1/2	407.5	1.325	127-2600	7-2 1/2 x 13 1/2	Y/Ful 54430	5/Tim 58415PA	B	R	Tim 35011TW	W44A	600	928C	TM	68 1/2 x 3 1/2 x 1 1/2	...		
9	D-1B	6500	149	27000	9500/10.00/20	11.00/20		Con B2427	6-4 1/2 x 5 1/2	407.5	1.325	127-2600	7-2 1/2 x 13 1/2	Y/Ful 54430	5/Tim 58415PA	B	R	Tim 35011TW	W44A	600	928C	TM	68 1/2 x 3 1/2 x 1 1/2	...		
10	D-1C	7000	149	27000	9500/10.00/20	11.00/20		Con B2427	6-4 1/2 x 5 1/2	407.5	1.325	127-2600	7-2 1/2 x 13 1/2	Y/Ful 54430	5/Tim 58415PA	B	R	Tim 35011TW	W44A	600	928C	TM	68 1/2 x 3 1/2 x 1 1/2	...		
11	D-1K	7400	149	27000	9500/10.00/20	11.00/20		Wau 140GK	6-4 1/2 x 5 1/2	407.5	1.325	127-2600	7-2 1/2 x 13 1/2	Y/Ful 54430	5/Tim 58415PA	B	R	Tim 35011TW	W44A	600	928C	TM	68 1/2 x 3 1/2 x 1 1/2	...		
12	D-2Z	7550	149	27000	9500/10.00/20	11.00/20		Wau 140GK	6-4 1/2 x 5 1/2	407.5	1.325	127-2600	7-2 1/2 x 13 1/2	Y/Ful 54430	5/Tim 58415PA	B	R	Tim 35011TW	W44A	600	928C	TM	68 1/2 x 3 1/2 x 1 1/2	...		
13	D-3S	7850	162	28000	10000/11.00/20	11.00/20		Con 22R	6-4 1/2 x 5 1/2	554.6	4.456	184-2400	3-3 1/2 x 13 1/2	Y/Ful 54650	5/Tim S-200P	S2	R	Tim 35011TW	W44A	673	1031C	TM	68 1/2 x 3 1/2 x 1 1/2	...		
14	D-3S	7850	162	28000	10000/11.00/20	11.00/20		Con 22R	6-4 1/2 x 5 1/2	554.6	4.456	184-2400	3-3 1/2 x 13 1/2	Y/Ful 54650	5/Tim S-200P	S2	R	Tim 35011TW	W44A	673	1031C	TM	68 1/2 x 3 1/2 x 1 1/2	...		
15	D-3S	7850	162	28000	10000/11.00/20	11.00/20		Con 22R	6-4 1/2 x 5 1/2	554.6	4.456	184-2400	3-3 1/2 x 13 1/2	Y/Ful 54650	5/Tim S-200P	S2	R	Tim 35011TW	W44A	673	1031C	TM	68 1/2 x 3 1/2 x 1 1/2	...		
16	D-3S	8030	149	27000	9500/10.00/20	11.00/20		Con B2427	6-4 1/2 x 5 1/2	407.5	1.325	127-2600	7-2 1/2 x 13 1/2	Y/Ful 54430	5/Tim 58415PA	B	R	Tim 35011TW	W44A	600	928C	TM	68 1/2 x 3 1/2 x 1 1/2	...		
17	Willis (Std. Del.) 463	1285*	104	104	4000	2752/6.50/168	7.00/16S		Own 463	4-3 1/2 x 4 1/2	1346.6	5.105	60-4000	3-2 3/2 x 4 1/2	N/WG T96	3/Spl 23-1	Hy	H 4.88-5.38	Own I Tr	B41H	133	220a	2I	42.28 5/8 x 2 1/2 x 1 1/2	T/D	
18	Willis (Std. Del.) 2WD	1185*	118	118	5300	2758/6.50/168	7.00/16S		Own 2WD	4-3 1/2 x 4 1/2	1346.6	5.105	60-4000	3-2 3/2 x 4 1/2	N/WG T96	3/Tim 51540N	2F	H 4.88-5.38	Own I Tr	B41H	176	270a	2I	42.28 5/8 x 2 1/2 x 1 1/2	T/D	
Four-Wheel-Drive																										
19	Corbett	22FC	156	Opt	22000	9.00/20	10.00/20		Con B6371	6-4 1/2 x 5 1/2	371.6	0.280	100-2600	7-2 1/2 x 13 1/2	Y/Fu 5443	5/Tim R2090H	2F	H	8-4.3	Tim F2090H	L41HV	...	865a	TD	74 9 3/8 x 3 1/2	DL
20	Dodge	B-1-PW	126	126	8700	7.50/16-8	9.00/16-8		Own T-137	6-3 1/2 x 4 1/2	230.6	7.185	94-3200	4-2 1/2 x 4 1/2	Y/NP-35580	4/Own T-137	HyF	H 4.8-5.8	Own T-137	O41H	210	311Co	TX	52 1/2 x 3 1/2 x 1 1/2	C	
21	FWD	HA	132	156	17000	4747/8.25/20D	10.00/20		Wau BZ	6-4 1/2 x 5 1/2	320.5	9.237	104-3000	7-2 1/2 x 10 1/2	Y/Own H	5/Own H	SF	H 6.6	9.00	Own H	L41HV	391	807a	T4	79 1/2 x 3 1/2 x 1 1/2	T
22	HR	HA	132	156	17000	4747/8.25/20D	10.00/20		Wau BZ	6-4 1/2 x 5 1/2	320.5	9.237	104-3000	7-2 1/2 x 10 1/2	Y/Own H	5/Own H	SF	H 6.6	9.00	Own H	L41HV	391	807a	T4	79 1/2 x 3 1/2 x 1 1/2	T
23	HR	HA	132	156	17000	4747/8.25/20D	10.00/20		Wau BZ	6-4 1/2 x 5 1/2	320.5	9.237	104-3000	7-2 1/2 x 10 1/2	Y/Own H	5/Own H	SF	H 6.6	9.00	Own H	L41HV	391	807a	T4	79 1/2 x 3 1/2 x 1 1/2	T
24	HR	HA	132	156	17000	4747/8.25/20D	10.00/20		Wau BZ	6-4 1/2 x 5 1/2	320.5	9.237	104-3000	7-2 1/2 x 10 1/2	Y/Own H	5/Own H	SF	H 6.6	9.00	Own H	L41HV	391	807a	T4	79 1/2 x 3 1/2 x 1 1/2	T
25	HR	HA	132	156	17000	4747/8.25/20D	10.00/20		Wau BZ	6-4 1/2 x 5 1/2	320.5	9.237	104-3000	7-2 1/2 x 10 1/2	Y/Own H	5/Own H	SF	H 6.6	9.00	Own H	L41HV	391	807a	T4	79 1/2 x 3 1/2 x 1 1/2	T
26	(D)	M7D	150	180	38600	15700/12.00/20D	12.00/24		Bu DC344	6-5 1/2 x 6 1/2	844.1	6.065	180-1800	7-3 1/2 x 17	Y/Own M	10/Tim 1758	2F	H	7.33	W41A F409	W41A	576	976a	T4	90 10 1/2 x 3 1/2	C
27	(D)	M7D	150	180	38600	15700/12.00/20D	12.00/24		Bu DC344	6-5 1/2 x 6 1/2	844.1	6.065	180-1800	7-3 1/2 x 17	Y/Own M	10/Tim 1758	2F	H	7.33	W41A F409	W41A	576	976a	T4	90 10 1/2 x 3 1/2	C
28	Marmouk MH40-4	158	170	24000	43300/9.00/20D	10.00/20		Her WXLC3	6-4 1/2 x 5 1/2	404.6	4.293	118-2800	7-2 1/2 x 13 1/2	Y/Fu 54430	5/Tim R2090W	2B	H	8.43	Tim F2090W	W...	584	887e	F	72 9 1/2 x 3 1/2	T	
29	Her...	158	170	24000	43300/9.00/20D	10.00/20		Her RXC	6-4 1/2 x 5 1/2	404.6	4.293	118-2800	7-2 1/2 x 13 1/2	Y/Fu 54430	5/Tim R2090W	2B	H	8.43	Tim F2090W	W...	584	887e	F	72 9 1/2 x 3 1/2	T	
30	(C) CM-4	134	134	24000	42200/10.00/20	11.00/22		Ford	8-3 1/2 x 5 1/2	239.6	4.180	3000-3	2 1/2 x 4 1/2	N/Ford	4/Ford	S	H	6.67	Own M5	F...	303	563a	F	84 7 1/2 x 3 1/2	T	
31	(C) CM-4	134	134	24000	42200/10.00/20	11.00/22		Ford	8-3 1/2 x 5 1/2	239.6	4.180	3000-3	2 1/2 x 4 1/2	N/Ford	4/Ford	S	H	6.67	Own M5	F...	303	563a	F	84 7 1/2 x 3 1/2	T	
32	(C) LD6-4	114	114	4700	4719/5.70/17	7.50/17		Ford	6-3 1/2 x 4 1/2	239.6	4.180	3000-3	2 1/2 x 4 1/2	N/Ford	4/Ford	S	H	6.67	Own M5	F...	303	563a	F	84 7 1/2 x 3 1/2	T	
33	(C) LD6-4	114	114	4700	4719/5.70/17	7.50/17		Ford	6-3 1/2 x 4 1/2	239.6	4.180	3000-3	2 1/2 x 4 1/2	N/Ford	4/Ford	S	H	6.67	Own M5	F...	303	563a	F	84 7 1/2 x 3 1/2	T	
34	(C) OT-4	122	122	6800	4500/7.50/17	7.50/17		Ford	6-3 1/2 x 4 1/2	239.6	4.180	3000-3	2 1/2 x 4 1/2	N/Ford	4/Ford	S	H	6.67	Own M5	F...	303	563a	F	84 7 1/2 x 3 1/2	T	
35	Onkosh	150	204	25000	10200/10.00/20	11.00/22		Her WXLC3	6-4 1/2 x 5 1/2	404																

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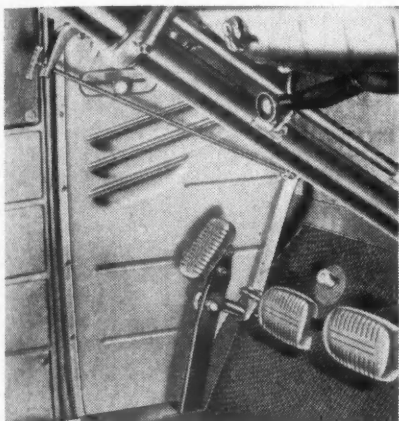
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 ▲ Special W B's, available on request. 8031P-G Spicer Auxiliary Transmission Available.
 ▲ 8031P-G Spicer Auxiliary Transmission Available.

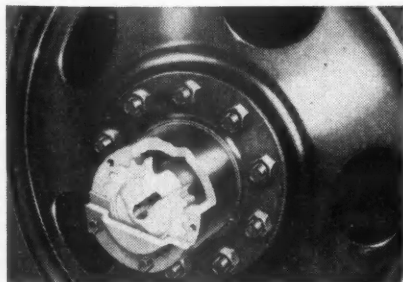
Chevrolet Announces Additional Mechanical Refinements for 1948

CHEVROLET has announced major mechanical improvements in its Advance-Design line of trucks for 1948. Most radical change in the medium and heavy-duty ranks is in the 4-speed transmission which is provided with synchro-mesh and helical gears in 2nd, 3rd and 4th speeds to assure easier and quicker shifting and quieter operation. In addition, it is claimed that the necessity for frequent double clutching is eliminated. Shifting into reverse is now accomplished by moving the lever to the left of the low gear position. The transmission is huskier, and the case has been newly designed to reduce the possibility of oil leaks.



Light model trucks have a foot-operated hand brake with a hand release located on dash. Provides clear floor space

All standard and regular production option 4000, 5000 and 6000 series rear axles have a newly designed hub-to-axle shaft attachment. Driving torque is now transmitted from shaft to hub through mating splines, external on the shaft and internal on the hub. A bolt-attached cover and



A stronger, better sealed axle attachment. Driving torque is transmitted from shaft to hub through mating splines

gasket are separate from the axle. The cover and gasket are not strained by the power flow from the axle shaft to hub,

with the result that the oil seal is more effective. The new splined axle is easily removed for servicing.

All heavy-duty series as well as series 3800 now feature a simplified propeller shaft bearing support. The rubber-mounted bearing is a single row type permanently sealed and lubricated. Several changes in the baffle improve sealing against water and dirt. To further prevent the entrance

of foreign materials, traps at each end of the bearing are packed with waterproof grease.

A new 11-leaf rear spring assembly of greater capacity now replaces the former 10-leaf assembly in the 4000, 5000 and 6000 series (4502 and 6702 uses 11-leaf 2-stage spring). Used in combination with the 6-leaf auxiliary spring, a total spring rating of 15,600 lb. for the rear axle is now available.

A new heavier 8-leaf front spring assembly is now standard equipment on all 3100 series trucks. This replaces the former 7-leaf, increases capacity and minimizes bottoming on rough roads.

(TURN TO PAGE 143, PLEASE)



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MAREMONT SPRINGS

MAREMONT AUTOMOTIVE PRODUCTS, INC.
1600 S. Ashland Ave. Chicago 5, Ill.
Branches at Chicago, Cleveland and Harvey, Ill.

1947 New Truck Registrations by Makes by States*

STATE	Auto-car	Brookway	Chevrolet	Diamond T	Divco	Dodge	Federal	Ford	FWD	GMC	International	MacK.	Osh-kosh	Reo	Sterling	Studebaker	Ward La France	White	Willys	All Others	Total	
Alabama	Nov. 910		19	8	348	15	556		149	257	10			41		72		19	174	1	2,579	
Nov. Mos. 4	4929		93	28	2304	76	3883	1	952	2025	91			264		493	1	169	1080	69	16,442	
Arizona	Nov. 174		2	2	53	2	88		35	56	1			4		33		9	27		4,486	
Nov. Mos. 4	1140		25	12	569	18	1051	4	279	406	12			94	4	293		47	311	39	4,306	
Arkansas	Nov. 368		10		120	2	170		54	80	1			6		22		2	72	1	906	
Nov. Mos. 4	4425		83		1830	40	3776		763	1423	27			99		483		59	955	26	13,789	
California	Nov. 25	2	1990	59	52	716	11	951	28	464	564	38		24	8	339	2	61	248	77	5,657	
Nov. Mos. 340	48	13539	446	310	8121	162	11766	179	3917	6022	344		497	107	3455	9	565	2084	890	52,799		
Colorado	Nov. 2		192	6	76	5	123	3	43	90	3		2	11		33		7	58	4	685	
Nov. Mos. 27		2112	113	52	1076	42	2224	74	505	1341	47		2	106		384	9	73	676	63	8,906	
Connecticut	Nov. 12	7	238	14	17	108	20	132	10	63	81	37		9	1	58		7	43	6	861	
Nov. Mos. 182	132	1795	121	90	1086	163	1286	36	457	1250	262		120	6	443		152	400	82	8,053		
Delaware	Nov. 51		3	4	49		23		13	28	2			5		6		3	12		199	
Nov. Mos. 19	21	601	20	24	465	1	613	4	154	360	17			24		110	2	28	94	17	2,571	
Dist. of Col.	Nov. 1		80	4	3	31	5	43		30	25			6	2	9		1	5	1	246	
Nov. Mos. 19	19	672	42	100	474	31	704		271	368	29			51	2	129		47	105	18	3,022	
Florida	Nov. 1		506	18	173	3	259		66	120	20			19		80		6	105	17	1,393	
Nov. Mos. 37	1	5075	174	34	2251	71	4105	35	814	1746	224			214		771	4	164	879	174	16,773	
Georgia	Nov. 7	2	5856	185	11	2741	63	5180	1	938	2077	162		239	1	711		18	934	69	1,519	
Nov. Mos. 9		1414	65	17	649	55	1241	14	310	761	17			5		46		2	39	6	538	
Idaho	Nov. 11	4	1043	65	16	381	28	411	5	143	489	25		73	2	373		20	418	59	5,498	
Nov. Mos. 236	54	1141	1038	366	6025	261	9200	18	2232	6281	380			48		149		66	174	15	3,076	
Illinois	Nov. 5	8	732	41	10	268	8	210	6	108	323	14		745	17	1348	3	858	1398	371	42,963	
Indiana	Nov. Mos. 38	119	5647	369	147	3511	144	4913	37	1333	3848	112		29		148		50	135	24	2,119	
Nov. Mos. 1		596	22	3	193	2	136	1	62	237	11			414	1	1657		429	1236	239	24,231	
Iowa	Nov. 5	2	4739	288	59	2368	61	4070	18	765	3137	157		28		62		11	135	3	1,563	
Nov. Mos. 10	1	5020	239	24	1717	155	3831	1	779	2222	48			17		888	2	142	1338	77	18,532	
Kansas	Nov. Mos. 10	1	543	28	188	25	164		76	199	5			26		53		6	78	4	1,200	
Kentucky	Nov. Mos. 16		4431	171	19	2122	127	3443	1	825	2014	96		236		611		131	1552	99	15,904	
Louisiana	Nov. Mos. 15		223	33	3	127	5	137	1	39	83	11		13		38		18	141	3	880	
Nov. Mos. 2		3297	184	19	167	46	2965	2	580	1542	112			144		621		158	776	26	12,104	
Maine	Nov. Mos. 24	32	1733	19	26	1005	72	1832	7	414	1063	113		12	1	27		2	6	49	4	619
Maryland	Nov. Mos. 7	8	318	8	3	165	10	105		43	92	12		16		46		1	7	44	1	892
Massachusetts	Nov. Mos. 95	99	3038	76	138	1885	116	2388		587	1420	170		232		529	22	145	445	72	11,457	
Nov. Mos. 12	12	462	21	31	260	12	208		98	170	29			18		58		25	28	6	1,437	
Michigan	Nov. Mos. 262	239	3488	246	325	2649	100	3765	5	1011	2232	408		2	262	120	784	32	348	516	112	16,936
Nov. Mos. 5	6	1035	33	28	338	57	471	1	164	169	18			70		130		42	230	9	2,886	
Minnesota	Nov. Mos. 75	56	7193	332	385	5270	484	7369	3	1669	2839	145		771	1	1326	17	303	1755	291	30,274	
Nov. Mos. 5		304	15	4	191	15	218	1	65	203	12			11		65	2	26	118	6	1,261	
Mississippi	Nov. Mos. 54	2	3871	192	75	2342	201	4087	32	771	2509	131		7	142		855	17	296	639	94	16,377
Nov. Mos. 2		773	26		267	5	430		118	185	19			19		72		14	96	2	2,026	
Missouri	Nov. Mos. 2		4506	110	2	1763	33	3640	1	776	1418	95		120		516		99	858	25	13,966	
Nov. Mos. 22	9	776	25	3	249	9	289		131	247	9			12		87		19	130	15	2,001	
Montana	Nov. Mos. 22	9	7349	288	100	3239	126	6013	3	1359	3347	123		228		1017	4	295	1433	121	25,118	
Nov. Mos. 5		189	5		56	8	95	2	32	104	4			11		33		6	77	3	625	
Nebraska	Nov. Mos. 1		1907	80	3	1031	40	1476	20	342	1025	9		1	82	2	42		61	930	50	7,544
Nov. Mos. 6		316	16		153	9	112	1	57	257	16			12		69		19	71		1,106	
Nevada	Nov. Mos. 1	1	2638	228	17	1423	73	2358	28	541	1926	145		3	135		605		211	858	34	11,230
Nov. Mos. 8		43	21	1	22	33			14	17	1					6		1	11	4	153	
New Hampshire	Nov. Mos. 8		285	2	3	221	2	295	7	84	189	3		1	15	2	25		10	71	25	1,317
Nov. Mos. 22	10	68	2	6	35	1	23		12	31	10			3		4		5	10	2	213	
New Jersey	Nov. Mos. 22	10	806	28	18	552	17	718		168	453	125		77	16	146		52	204	38	3,448	
Nov. Mos. 25	62	762	54	34	347	28	368	1	215	417	91			32	9	115	1	50	139	24	2,774	
Nov. Mos. 312	495	4639	288	332	2774	184	3801	13	1392	2645	709		2	235	17	874	40	400	877	213	20,242	
New Mexico	Nov. Mos. 66	107	1101	94	61	810	29	506	16	322	483	185		6	88	8	204	11	67	199	36	4,401
Nov. Mos. 909	1422	10479	975	487	8993	486	9515	131	3259	6549	2050		56	1026	71	2141	169	1275	2128	542	52,643	
North Carolina	Nov. Mos. 5		913	7	2	230	15	271		62	105	23		30		97		34	137	14	1,917	
Nov. Mos. 39	15	6970	128	34	2928	158	5207	11	638	1910	346			386		1022	4	305	1449	124	21,672	
North Dakota	Nov. Mos. 4		79	10	1	38	6	105	1	22	131	4		7		34		4	30		472	
Nov. Mos. 27	3	1162	35	27	437	36	323	2	225	401	55			66		154		88	451	11	3,503	
Ohio	Nov. Mos. 292	67	9883	436	366	6569	394	8716	29	2399	5581	649		1	763	1	1838	19	1195	2761	383	42,346
Oklahoma	Nov. Mos. 3		439	3	8	222	5	313	1	98	302	9		22		69		14	105	3	1,673	
Nov. Mos. 3		4379	68	39	2423	54	3940	7	769	2584	85			188		723	4	173	915	47	11,409	
Oregon	Nov. Mos. 44	1	2812	218	40	1779	130	2115	27	701	1331	107		137	13	718		156	829	153	11,311	
Nov. Mos. 38	83	981	46	11	698	31	533		277	483	116		11	57	3	200	5	112	222	29	3,936	
Pennsylvania	Nov. Mos. 556	863	9848	680	152	8036	378	9314	44	2701	6379	1054		88	870	76	2388	64	1152	2189	360	47,621
Rhode Island	Nov. Mos. 16		99	2	7	45		50		99	41	4		7		1		3	8	7	325	
Nov. Mos. 101	7	854	44	88	460	10	644	2	199	404	45			34	8	147	3	61	107	30	3,248	
South Carolina	Nov. Mos. 6		3121	47		1565	32	2700	26	436	812	131		24		413		126	645	84	10,347	
Nov. Mos. 2		97	10	3	54	5	77	1	32	139	3			9		32		6	40	2	811	
South Dakota	Nov. Mos. 10		876	106	3	811	43	1020	10	245	878	31		81		251		40	598	11	5,007	
Tennessee	Nov. Mos. 12	17	6753	139	28	3122	207	4677	24	1482	2721	207		22		68		16	91	6	1,905	
Nov. Mos. 4		1649	24	6	728	15	837		284	688	28			296	3	836		281	1157	148	22,112	
Texas	Nov. Mos. 1	20	14002	333	120	7575	156	12115	6	2544	6512	356		52		198	1	78	312	16	4,820	
Nov.																						

REVOLUTIONARY ADVANCEMENT*

in

WARNER ELECTRIC BRAKES



NEW
NEW

16½"x5", 16½"x6"**, 16½"x7" Sizes

Two-Shoe Construction

NEW

For More Effective Stopping Power!

These big, new, powerful Warner Electric Brakes — with their two-shoe hinge construction, incorporate the most modern and advanced brake engineering — and provide an entirely new concept of *effective stopping power*.

INSTANTANEOUS, POSITIVE ACTION As with all Warner Electric Brakes, positive-acting braking power is developed within the brake itself. Because the braking mechanism is *electrically controlled*, there is no time lag. Regardless of distances from cab to rear trailer wheels, any amount of stopping power is *instantly available*. Even with this remarkably fast action, the larger, wider, two-shoe brake operates with velvety smoothness never before achieved in brakes of any other type.

UNMATCHED ECONOMY The new Warner Electric Brakes are inexpensive to install. Use only as much current as a tail light. Require minimum servicing thus preventing costly delays and tie-ups of equipment.

CONTROLLED BRAKING POWER Driver can pre-set "Vari-Load" dial on dash to meet load and road conditions.

SYNCHRONIZED OPERATION WITH EITHER AIR OR HYDRAULIC SYSTEMS Warner Controller synchronizes hydraulic, vacuum or air brakes on tractor with Electric Brakes on trailer. Regular tractor foot pedal then operates both systems *together*.

ASSURED DEPENDABILITY The new two-shoe Warner Electric Brakes assure years of dependable operation. Warner Electric Brakes have been performance-proved by leading tractor-trailer operators during many years of efficient, trouble-free service.

GREATER SAFETY When both the tractor and trailer are equipped with Warner Electric Brakes their *instantaneous* "stopping power" under *absolute control* assures greater safety. All brakes "come in" at the same instant, but with varying *amounts* of power. Therefore, rear trailer wheels get the *effect* of coming in first — and the tendency to skid or jackknife is prevented, thus giving greater protection to the driver and load — and avoiding costly repairs or tie-up of equipment.

For maximum performance and satisfaction, standardize on Warner Electric Brakes. Write for illustrated literature explaining all their many advantages.

WARNER ELECTRIC BRAKE MFG. CO.
BELOIT, WISCONSIN

Specialists in the manufacture of Electric Brakes since 1927

*REVOLUTIONARY ADVANCEMENT

More rugged construction, rigid shoes, longer lining life, smoother control and dependable performance under severe conditions. No other brakes equal the new Warner Electric Brakes for simplicity of design and construction. Full clearance under tractor and trailer — nothing to get knocked off, leak, chatter or freeze. No exposed braking equipment — no rods to rattle — no tubes to split — no troublesome boosters and hose connections. One rugged all-purpose Electrical Cable Connection provides contacts for brakes, running lights, parking lights, stop and turn signals — ALL electrical contacts. As easy to plug in as a radio.

****Available September 1**



SINCE 1927



SAE TRANSPORTATION MEETING TO PRESENT TIMELY SUBJECTS

The National Transportation Meeting of the Society of Automotive Engineers, to be held at the Bellevue-Stratford Hotel, Philadelphia, Mar. 30 to Apr. 1, will include functions of both the Transportation & Maintenance and the Truck & Bus activities of the SAE. Gavin W. Laurie, Manager of Automotive Transportation, Atlantic Refining Co., will be the general chairman.

Principal papers to be presented and the speakers are:

Tuesday morning, Mar. 30: "Progress in Insulating of Busses," by K. L. Raymond, GMS Truck & Coach Division.

Tuesday afternoon: "Operating Experience with Weight-Reducing Materials in Vehicle Design," by J. L. S. Snead, Jr., Consolidated Freightways.

Wednesday morning, Mar. 31: "Improvement in Design & Maintenance of Electrical Equipment," by J. A. Bolles, Delco-Remy Division.

Wednesday afternoon, "Comparative Performance of Fuel Injection vs. Carbureted Gasoline Engines," by George M. Lang, Ex-Cell-O-Corp.

Thursday morning, Apr. 1: "Modern Sealed Cooling Systems," by S. M. Young, Young Radiator Co.

Thursday afternoon: "Experience with Apprentice Training," by A. W. Newman, The Willet Co.

'47 NEW TRUCK REGISTRATIONS ESTIMATED CLOSE TO 900,000

New truck registrations for November totaled 73,737 units, and for the first 11 months of 1947, 811,442. With estimates for December running slightly ahead of the November figure, it is expected that total new truck registrations for the year will approximate 900,000. Production for domestic use estimates place the 1947 truck total at slightly under 1,000,000 vehicles. For breakdown of new registrations by state and by make, see page 90.

HARVESTER BUYS METRO

Purchase of the principal stock ownership of the Metropolitan Body Co., Bridgeport, Conn., by the International Harvester Co. was announced Jan. 10 in a joint statement by W. C. Schumacher, general manager of Harvester's motor truck division, and Philip and William Carlson, president and vice-president, respectively, of the body company.

DATES & DOINGS

MAR. 30—APR. 1—National Transportation Meeting, Society of Automotive Engineers, Bellevue-Stratford Hotel, Philadelphia, Pa.

APRIL 1-3—Louisiana Motor Transport Assn. convention, Heidelberg Hotel, Baton Rouge, La.

APRIL 13-16—18th Annual Safety Convention of the Greater New York Safety Council, in the Hotel Pennsylvania, New York City.

APRIL 24—Illinois Motor Truck Operator's Assn. annual banquet, Palmer House, Chicago, Ill.

MAY 6-8—Washington Motor Transport Assn. convention, Davenport Hotel, Spokane, Wash.

MAY 21-22—Associated Motor Carriers of South Dakota convention, Alonzo Ward Hotel, Aberdeen, S. D.

JUNE 11-12 Pennsylvania Motor Truck Assn. annual meeting, Penn Harris Hotel, Harrisburg, Pa.

JULY 16-24—Road Show, American Road Builders' Assn., Soldier Field, Chicago, Ill.

OCT. 8-13—American Trucking Assns. annual convention, Hotels Statler and Mayflower, Washington, D. C.

PIGOTT NAMED SAE HEAD



R. J. S. Pigott

Reginald James Seymour Pigott, who since 1929 has been chief engineer of Gulf Research & Development Co., Pittsburgh, Pa., was introduced as 1948 president of the Society of Automotive Engineers at the annual meeting in Detroit on Jan. 14.

He has been an SAE member since 1918 and was a councilor in 1945 and 1946. He is also director of Automotive Engine Projects for the Coordinating Research Council and chairman of the CRC Engine Section.

The 1948 treasurer is B. B. Bachman, vice-president in charge of engineering, Autocar Co. SAE vice-president for Transportation & Maintenance is Warren A. Tausig, Burlington Truck Lines, Inc., while Dale Roeder of Ford Motor Co. heads the Truck & Bus activity.

GAUSSOIN REAPPOINTED

Julius Gaussoin, of the Silver Eagle Co., Portland, Ore., has been reappointed chairman of the Equipment and Maintenance Committee of the American Trucking Associations, Inc., by Ed J. Buhner, president of ATA. Mr. Gaussoin is also active in the work of the Society of Automotive Engineers and is chairman of the Maintenance and Equipment Committee of the Oregon Motor Transport Association.

ICC TO INVESTIGATE LEASING, SETS APRIL 19 FOR HEARING

Division 5 of the Interstate Commerce Commission has ordered a thorough investigation of the truck leasing practices of all motor carriers coming under its jurisdiction and has scheduled a public hearing for 9.30 a.m., April 19, at the ICC offices in Washington, D. C., before Examiner C. Evans Brooks.

The investigation will cover these categories of truck leases or rentals: (1) those made between for-hire carriers for the purposes of augmenting equipment, (2) those entered into for the interchange of equipment by for-hire carriers, and (3) those calling for the rental of motor vehicles and equipment to private carriers or shippers.

The rules adopted by the Commission in this proceeding will be applicable to all agreements, contracts or leases entered into between common or contract motor carriers subject to the general provisions of Part 2 of the Motor Carrier Act, and between such carriers and private motor carriers or shippers. However, they will have no valid application to any leasing arrangement between one private carrier and another.

The Commission's tentative proposals covering vehicle rentals to private carriers and shippers would impose the following restrictions, among others, upon for-hire carrier lessors: (1) Prohibit rental of equipment with drivers; (2) Prohibit leasing of equipment without drivers unless (a) period of lease is for 180 days or more, (b) lessee has exclusive use of the equipment during the entire leasing period, (c) lessor removes all marks of identification from the vehicle, (d) the terms and conditions of the lease agreement are reduced to writing setting forth the charges to be made, the method used in computing such charges, the definite period within which the lease is effective, and a complete statement of all other terms affecting the rental service.

INDUSTRIAL NOTES

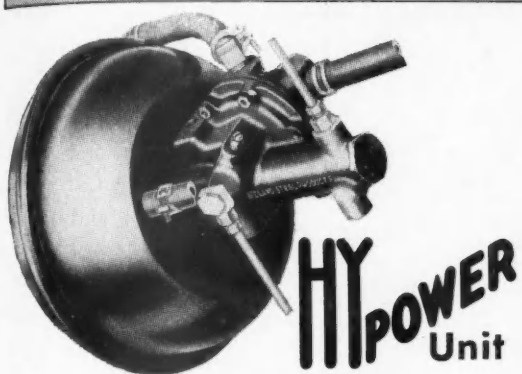
Auto-Lite Battery Corp. has completed plans for a new manufacturing plant at Clearwater, Cal.

Highway Trailer Co. has announced plans for locating its factory service department in Chicago, rather than at the plant in Edgerton, Wis. It is expected that the new location will speed up delivery of parts throughout the country.

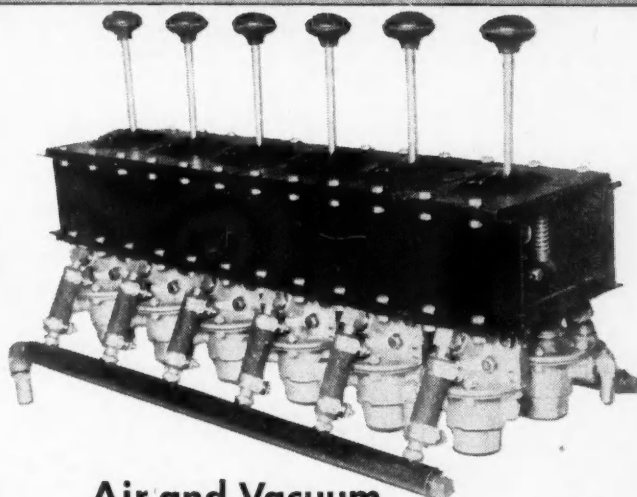
The Linde Air Products Co. is building

(TURN TO PAGE 94, PLEASE)

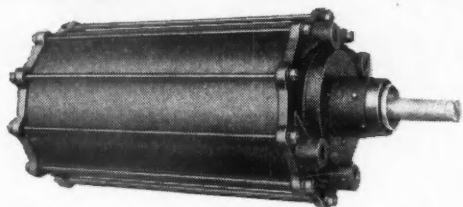
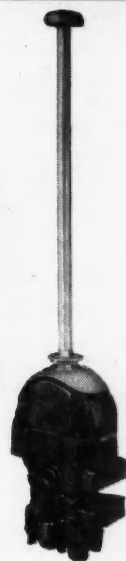
See **MIDLAND** for



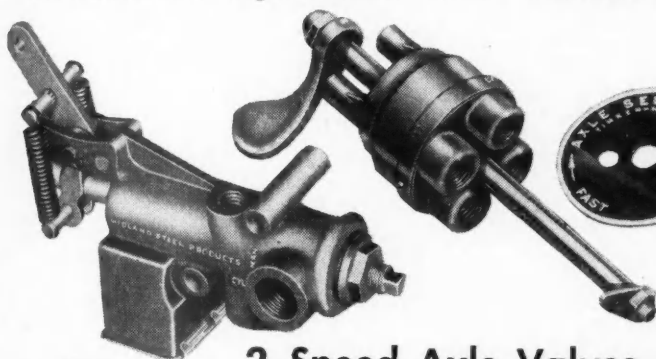
HY POWER
Unit



Air and Vacuum
Shovel and Crane Controls



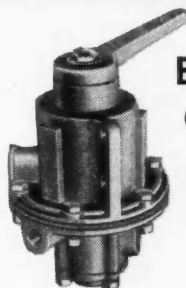
Industrial Cylinders and Valves



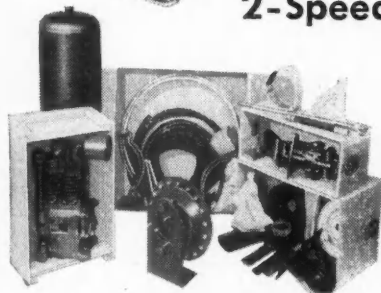
2-Speed Axle Valves



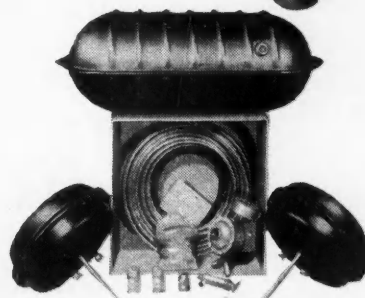
Bus Door
Controls



Slack Adjusters



Air Brake Kits



Vacuum Brake Kits

THE MIDLAND STEEL PRODUCTS COMPANY

6660 MT. ELLIOTT AVENUE • • DETROIT 11, MICH.

Export Department: 38 Pearl Street, New York, N. Y.

MIDLAND
POWER BRAKES

CCJ Newscast

(CONTINUED FROM PAGE 92)

a new oxygen filling station, acetylene producing plant and warehouse at Little Rock.

Camcar Products Co. (screw products) has completed a new plant at 600 18th Ave., Rockford, Ill.

The Ohio Crankshaft Co. has purchased the Induction Heating Division of the Budd Co., located in Detroit, for use by its Tocco Division.

Socony-Vacuum Oil Co., Inc., is rehabilitating its refinery in East St. Louis, Ill., as part of a \$45,000,000 expansion and improvement program.

LEE HEADS ICC FOR '48

Commissioner William E. Lee has been elected chairman of the Interstate Commerce Commission for the 1948 year, succeeding Commissioner Clyde B. Aitchison. A former chief justice of the Idaho Supreme Court, he was first appointed to the ICC in 1934.

SAFETY NOT BUILT-IN

Latest statistics comparing death rates on the Pennsylvania Turnpike with similar rates on other highways confirm the view that safety cannot be "built-in." While death rates for the last six months of 1946 compared with the first three months of

1940 for the nation's highways as a whole declined from 11.5 to 10 per 100 million vehicle miles, and from 10.5 to 8 on Pennsylvania highways, the Turnpike rate went up from 9.5 to 13.8. Furthermore, since pedestrians are not allowed, it is assumed that the Turnpike figures include foot traffic while all the other figures do. It is estimated that such inclusion would make the Turnpike totals about 25 per cent worse.

1947 Truck Trailer Production*

	November	11 Mos.
Vans:		
Insulated and refrigerated.....	89	1,771
Furniture.....	35	973
All other closed top.....	1,226	17,440
Open top.....	56	1,537
Total Vans.....	1,406	21,721
Platforms:		
With cattle and stake racks.....	200	3,150
With grain bodies.....	83	1,196
All other.....	482	7,445
Total Platform.....	765	11,791
Tanks:		
Petroleum.....	275	2,063
All other.....	30	832
Total Tanks.....	305	2,895
Pole and Logging:		
Single axle.....	146	3,946
Tandem axle.....	62	1,442
Total.....	208	5,388
Low-bed heavy haulers.....	142	2,298
Off-highway.....	35	794
Dump trailers.....	16	602
All other trailers.....	124	1,363
Total Trailers.....	3,001	46,852
Chassis for trailers.....	265	3,147
Total Trailers and Chassis	3,266	49,999

* Data from Industry Division Bureau of the Census

TEAMSTERS-OPERATORS CONFERENCE ON SAFETY

A forward step in encouraging highway safety was taken in Los Angeles in January when 50 leading Teamsters Union officials and motor carrier operators sat down for a day-long discussion on how to improve truck safety through labor-management cooperation.

The conference, the first of several contemplated, was sponsored by the Western Highway Institute, coordinating agency for the for-hire trucking industry, in cooperation with the Motor Truck Association of Southern California and the Truck Owners Association of California.

Chairman of the day was R. H. Cutler, Portland, who heads the Institute. Frank W. Brewster, Seattle, acting for Dave Beck, Director of the Western Conference of Teamsters, headed the Teamsters' delegation. In a statement issued at the close of the meeting Mr. Cutler said, "The discussions between labor and management at Los Angeles have been so cordial and mutually satisfactory that we are determined to have at least two regional-level meetings between the groups each year. The possibilities for improving safety through joint action are practically unlimited."

(TURN TO PAGE 216, PLEASE)





No. 70-D Lock. Lug-leverage action. No. 16-R Round-Corner Hinge (below). Used on Strick Trailers.



EQUIPPED WITH

HANSEN

Body Hardware

LIGHT-WEIGHT Trailers for heavy duty, Strick trailer units are built to economize on bulk and weight, yet combine ruggedness and strength. Good reasons why Strick engineers specified Hansen.

Hansen Body Hardware is noted for its modern design, easy application and built-in performance. Examples are the Round-Corner Hinge and Door Lock shown at left. In keeping upkeep down, Hansen relieves the builder and user of needless worries.

A. L. HANSEN MFG. CO.
5047 RAVENSWOOD AVE., CHICAGO 40, ILL.

Steel flows on wheels, *too*



"GOING FULL BLAST"... America's more than 200 steel-making companies produced 18-million more tons of steel in 1947 than in any previous peacetime year... pouring out 85-million tons for 65% more users than in 1939. More than a billion dollars are being spent to improve plants and equipment and add 3-million tons of annual capacity.

AMERICA'S PATTERN of better living is cut from steel. Literally, from countless *kinds* of steel. For everything... from plowshares to skyscrapers... pipelines to hypodermic needles... calls for special steels... and in vast quantity.

Truck transportation adds new flexibility to steel delivery—from mill and

warehouse direct to the job. And, as in the steel industry itself, a great deal of versatility is required to perform each specialized transportation service efficiently. It is another vitally important field in which White Super Power is the choice of the leaders because Whites assure distribution efficiency in any truck-using



business for many more years of service at lowest cost. Your White Representative will gladly explain the cost-reducing *Correct Application* method of fitting trucks to your work requirements and acquaint you with the many advantages of White Super Power.

THE WHITE MOTOR COMPANY
Cleveland, Ohio, U. S. A.
THE WHITE MOTOR COMPANY OF CANADA LIMITED
Factory at Montreal

FOR MORE THAN 45 YEARS THE GREATEST NAME IN TRUCKS



... DEAN B. COPELAND as president of the American Bantam Car Co., succeeding Francis H. Fenn who died Nov. 29. JEROME P. BOWES, JR., is the new chairman of the board, and STANLEY WINKLER is vice-president.

... F. W. SOMMER as treasurer and T. V.

HOMAN as secretary of Mack Trucks, Inc., succeeding C. W. HASELTINE, retired.

... E. G. LYONS as manager of Highway Trailer Co.'s Buffalo branch and J. W. DIBBLE as manager of the St. Paul branch.

... JOHN J. PETERSON as Buffalo branch manager for the Trailmobile Co.

... H. C. PANNEBAKKER, JR., as temporary Detroit sales manager for the Strick Co., succeeding ELSWORTH J. TACKABERRY, deceased.

... W. F. HUNT of Hot Springs, Ark., as district manager in Arkansas, Eastern Oklahoma, and Northern Louisiana for Van Norman Co. He will assist RAY RAYMOND, who has been promoted to Mid-South Division manager.

... G. E. TENNEY as service manager of The Lincoln Electric Co.

... GEORGE MYERS as Hagerstown Plant Manager for the Perfect Circle Corp. succeeding GEORGE KEAGY, retired.

... ALLAN RAE as Toronto Branch Manager of A. Schrader's Son Division, Scovill Mfg. Co., succeeding S. A. HOWELL, retired.

... C. W. GRANGE as director of public relations for Stewart-Warner Corp.

... W. EARL GIVENS, JR., former chief of the Personnel Safety Section, Department of Safety, American Trucking Associations, Inc., as director of Safety and Personnel for the Geo. F. Alger Co., Detroit.

... WALTER HOLLAND, assistant manager of the Field Service Department of the American Trucking Associations, Inc., as executive secretary of the District of Columbia Trucking Association, succeeding W. EARL GIVENS, JR., resigned.



Profits Come From Economies

When you lick underinflation, you've made a real saving on your tire costs. To make certain there's no air-loss through tire valves, see that a Schrader Cap is screwed down finger-tight on every valve. Its powerful sealing unit guarantees an air-tight valve mouth up to 250 lbs. pressure.

Don't wait until your valve cores are worn out. Replace them. Also

make it a habit to check tires regularly with your own reliable Schrader Gauge. Correct pressures at all times increase tire economy and reduce the number of costly roadside flats.

Schrader Caps, Cores and Gauges give your tires extra miles—boost your profits. See your regular supplier today for your needs. To get the best—always specify Schrader.

SCHRADER CAPS, CORES AND GAUGES MAKE TIRES LAST LONGER!

Keep a Schrader Gauge in Every Vehicle



A. SCHRADER'S SON, Division of Scovill Manufacturing Company, Incorporated, BROOKLYN 17, N. Y.
World's Largest Manufacturer of Tire Valves, Gauges and Accessories



... E. C. QUINN as general sales manager of the Dodge Division, Chrysler Corp. He was former Detroit sales manager.



... WILLIAM T. KELLY, JR., as first vice-president of the American Brake Shoe Co. He is also president of Kellogg and Engineered Castings Divisions.

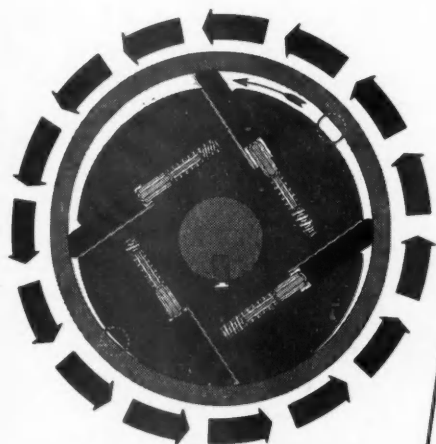


... HARVEY E. SCHACH (left) as sales manager of Power Brake Division, Midland Steel Products Co. A. R. LEUKHARDT (right) is new asst. sales manager.

(TURN TO PAGE 226, PLEASE)

6 Years . . . Over 260,000 miles with no interruption in service . . . for Unit equipped with

Wagner Air Brakes



The WAGNER Rotary Air Compressor

Check these features that are so desirable in Automotive Air Brake Systems: Rotary motion of all moving parts . . . In running balance at all times . . . Longer belt life due to more uniform torque loading . . . Low friction losses—therefore high operating efficiency . . . A predetermined air pressure range automatically maintained . . . Operating parts are lightly stressed, thereby insuring long life and low maintenance cost . . . Extremely quiet in operation . . . Self-contained oiling system—uncontaminated by engine waste products . . . Compact—requires minimum installation space . . . Low operating temperature prevents carbon formation in the compressor and delivery lines . . . Adaptable to all types of automotive systems.

Wagner Electric Corporation
6470 PLYMOUTH AVE., SAINT LOUIS 14, MO., U. S. A.



K48-3

PUGET SOUND POWER & LIGHT COMPANY

Wagner Electric Corp.
1918 1st Ave. South
Seattle, 4, Wash.

Att: Mr. A. P. Nelsen

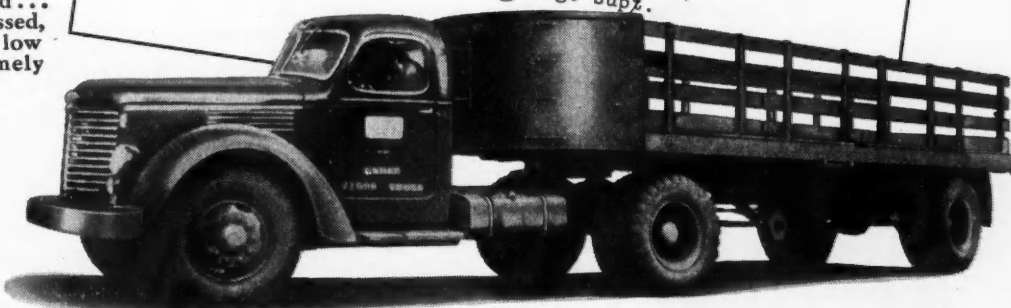
Gentlemen:

It occurred to me you would be interested in the performance of an AF1001 Wagner Rotary compressor used since April 15, 1941 on a KS8 1941 International Harvester tractor. This tractor pulls a 24 foot semi-trailer over all types of roads here in Western Washington, hauling all kinds of line material, heavy transformers and other apparatus to jobs located in many off-the-highway places. Needless to say, thoroughly dependable air brakes such as Wagner builds are "a must".

It is a pleasure to report that, as of April 1st 1947, the Wagner compressor has operated for over 260,000 miles with no interruption in service. We replaced the inexpensive control valve diaphragm twice during all that mileage and then did not lay the compressor up. Such performance you may be assured, is a real relief and satisfaction to both driver and superintendent.

Very truly yours

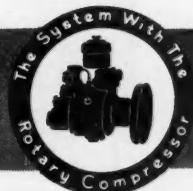
Wm. J. Stanaway
Wm. J. Stanaway
Garage Supr.



The enthusiastic praise in this unsolicited letter is typical of what users say about Wagner Air Brakes—The only Air Brakes that have the famous Rotary Air Compressor.

These outstanding air brakes can help you, too, in lowering your brake maintenance costs. Get complete information today. Write for Bulletin KU-50B.

LOCKHEED HYDRAULIC BRAKE PARTS and FLUID • ROBAL
CoMax BRAKE LINING • AIR BRAKES • TACHOGRAPHS
ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES



Reflective Materials

(CONTINUED FROM PAGE 59)

curate to one 10,000ths of an inch) at the factory and because of this factory application it is claimed that the uniformity is virtually perfect. The sheets are available either with the adhesive already applied or with a separate adhesive, the latter being recommended for application on porous surfaces. The plastic base is

supplied in a wide variety of colors which show up in color in daylight and reflect the same brilliant color at night. It also comes in neutral shades that reflect a brilliant silver at night. It is available in both regular and wide angle types, the latter particularly suited for curved surfaces. To achieve either lettering or special designs the sheets are cut to proper size and shape and affixed to any smooth background. The reflective material may also be painted over with opaque paint to produce reverse

color effects. Both treatments may be noted in the accompanying photographs.

Another inherent advantage of "Scotchlite" is the fact that it can and is now being produced on thin flexible fabric strips which may be sewed onto clothing fabrics. A panel of the material thus applied as decorative trim to a driver's uniform can offer life-saving protection when he dismounts at night, and it is already being widely used as a protection to traffic police and others on the highway at night.

Prismo Kit

THE Prismo Kit, on the other hand, contains the binder and spheres in separate containers together with a special applicator which may be either air or hand-powered. The binder is applied by brush or spray gun using stencil or silk screen to achieve the desired effect. Then while the binder is tacky, the spheres are sprayed on to the saturation point. It is claimed that the process is economical, requires no special skill and is as permanently attached as any good paint job. Control over the amount of spheres applied is said to be foolproof, due to the fact that up to the saturation point the spheres will adhere evenly and that beyond it they fall off harmlessly. Color effects visible both by day and at night can be achieved by introducing any desired tint into the binder before it is sprayed on.

In using the Prismo Kit for the reflectorization of highway signs State and County Highway Departments report from five to seven years' reflective durability. They also report a material cost of about seven cents per square foot for this application. The application work with the Kit involves very little more than an ordinary enamel coating operation with no additional equipment required.

Millions of Spheres

UNDER headlights at night, these materials reflect light brilliantly, directionally and in full color. Brilliance and directional control are achieved by the millions of tiny glass spheres. Serving as lenses, the spheres concentrate the reflected light, preventing diffusion. In addition, the lenses focus the light directly back toward the source of illumination.

(TURN TO PAGE 100, PLEASE)



...ALL WINTER LONG!

Added to lube oil, gas and all gear greases, MARVEL MYSTERY OIL gives battery-saving summer action to winter starts, and eases sub-zero shifting and steering. It adds motor-protecting toughness to thinner cold weather lubricants, and puts an oily armor on top cylinder parts that operate HOT all winter long. MARVEL cleans, too . . . prevents gum and varnish from building up and stealing power. Remember MARVEL when you think of oil, gas and gear greases, and let its sensational *total* action be YOUR answer to *total* winter lubrication needs. Emerol Manufacturing Co., Inc., 242 W. 69th St., New York 23, N. Y.

MARVEL MYSTERY OIL



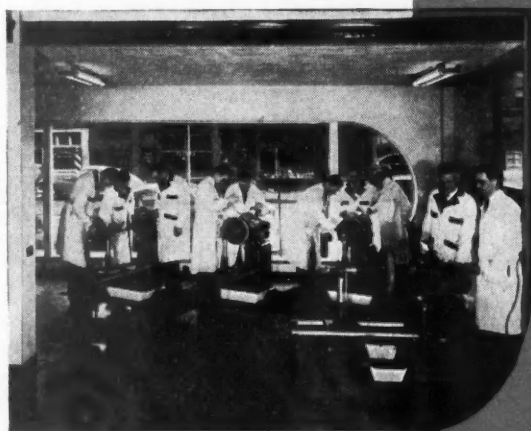
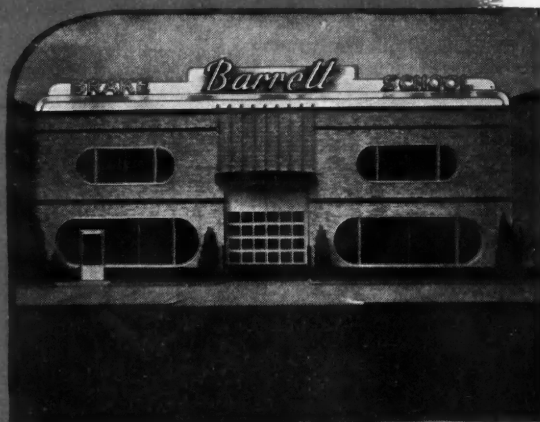
MARVEL HI-REV — for motor tune-up that swiftly dissolves gum and sludge. Ask for facts on this heavy-duty de-sludging compound.



MARVEL REVERSE OILER — a compact auxiliary lubrication system to meter Marvel Mystery Oil to top cylinder parts according to engine needs.

**THE NEW
BARRETT**
*An Opportunity
To Become A
Brake Specialist*

BRAKE SCHOOL



THE BARRETT BRAKE SCHOOL began operation in March with a specially selected group of experienced instructors of the highest calibre, and the finest of modern equipment. It is devoted to the training of men who service brakes.

Applications for this specialized brake service training should be made to your nearest Barrett Jobber, or direct to the Barrett Brake School. No tuition is charged while pilot classes are in operation.

BARRETT BRAKE SCHOOL

DIVISION OF BARRETT EQUIPMENT COMPANY • 21ST & CASS • ST. LOUIS 6, MO.

Reflective Materials

(CONTINUED FROM PAGE 98)

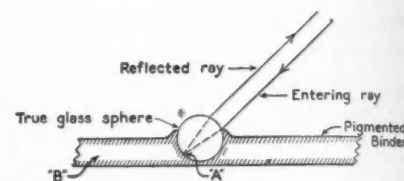
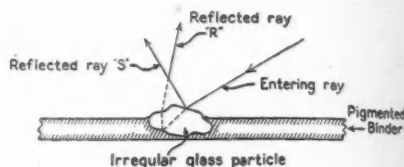
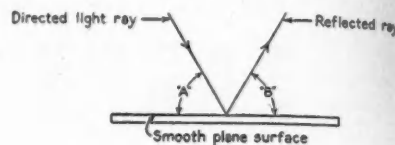
mination, the headlight beams of approaching traffic.

Applied to trucks and buses, the materials can be used to outline the size of the vehicle, to display the company name, to provide a reflective barricade on the tailgate or on rear doors, and to provide brightly legible warnings such as "DANGER,

EXPLOSIVES," or "CAUTION—SCHOOL BUS."

Although they derive this "lighted-up" appearance from approaching headlight beams, they are visible far beyond the apparent length of the beams. For example, a square foot of silver "Scotchlite" reflective material can be seen on a normally clear night more than 1500 ft. away. Larger applications, such as on tailgate barricades, outdoor advertising signs and traffic signs, can be seen at even greater distances.

Whatever the material, it is imperative that the reflective particles of glass be perfect spheres. A glance at the accompanying diagrams will show the reason. A perfectly flat sur-



face will reflect light back at an angle equal to the directed ray. Thus as soon as the light of an on-coming car becomes even a small number of degrees away from a direct right angle to the flat surface, its reflected rays would be entirely diverted. If, on the other hand, the reflective surface is irregular there is no control of the reflection at all—there being two reflections, one specular, the other reflex—and both wild. But with the true sphere, light is reflected back from point "A" directly toward the point of origin. The returning ray carries the color of the pigment "B."

Werner Experience

SPEAKING for "Scotchlite," Morris P. Greenberg, maintenance superintendent for Werner Transportation Co. of Minneapolis, which moves over 26,000,000 lb. of freight monthly, has this to say:

"At night when you see tail lights ahead, they look a long way off. But before you know it, you're on top of them. 'Scotchlite' on a truck ahead of you gives you a pretty good idea of its size and makes it easier to estimate how far ahead he is. Then you can slow up and approach him gradually—and in slippery weather, especially, that pays dividends in safety."

(TURN TO PAGE 102, PLEASE)



EberHARDWARE

SIDE DOOR CONTROL



No. 575720

BALL BEARING TYPE

FOR SOLID OR FOLDING DOORS

Eberhard

HINGES
LATCHES
DOOR IRONS
DOOR CONTROLS
DOOR HOLDERS
SEAT IRONS
LOCK HANDLES
SEAT PEDESTALS

LOCKS

REFRIGERATOR
PANEL DOOR
VAN BODY
SLIDING DOOR
ROPE HOOKS
LADDER HOLDERS
ETC.

Smooth in action and quiet in operation.

Over-center locking action with no set screws required. The rod is adjustable 1/2 inch in length.

The handle has two pivot holes permitting a 1 inch variation in throw. Can be adjusted to either 4 inch or 3 inch center of hinge bolt to center of bolt rod.

Finishes are plain or chromium.

Side Door Controls, like every EberHARDWARE item, are "purpose-tested" and built for long life under the most severe conditions of usage.

A copy of the new Eberhard Catalog will be mailed to you upon request.

Fixed Escutcheon Lock Handle

No. 5653

Attractively designed to blend with present day streamlined bodies. Escutcheon permanently attached to handle. Can be mounted vertically or horizontally.



EBERHARD

TRUCK BODY FITTINGS

Long Run



EBERHARD MANUFACTURING CO.

Division of the Eastern Malleable Iron Co. 2734 TENNYSON ROAD, CLEVELAND, OHIO



IT'S A "WET" RING

Steel-Vent is a *wet* ring. It has phenomenal oil-carrying capacity. It lets this extra oil flow freely to the cylinder walls to provide generous wall lubrication all the way up.

IT REALLY CONTROLS OIL

Millions of installations prove that Steel-Vent keeps this extra oil always under control. Its exclusive construction provides more than ample drainage for excess oil.

AND IT CAN'T CLOG

Steel-Vent can't clog. Its side-opening spacer operates against a moving segment with a "breathing" action that breaks up and flushes away clogging particles of carbon and gum.

These are three of the important reasons why you should put your money on Steel-Vent for any rering or rebore job.

HASTINGS MANUFACTURING COMPANY • HASTINGS, MICHIGAN
HASTINGS LTD., TORONTO



PISTON RING HANDBOOK

New 40-page handbook to help you turn out better work, easier and faster. Write for free copy or ask your jobber salesman.

TOUGH BUT OH SO GENTLE



HASTINGS

STEEL-VENT PISTON RINGS

Generous Wall Lubrication
Always Under Control

Reflective Materials

(CONTINUED FROM PAGE 100)

Asked what his drivers think of it, Greenberg commented, "They like it. And a lot of people who know us and who have seen our trucks on the road, write letters to us, asking about it."

The Werner Co. operates about 225 units of equipment, including 110 semi-trailers on the Minneapolis-

to-Chicago run. First application of "Scotchlite" was in May, and since then a total of 25 semi-trailers and tractors have been reflectorized, with the remaining semis scheduled for the treatment, Greenberg said.

On the tractors, the application consists of strips of silver on the bumper guard, and panels of the same material on the back of the rear-view mirrors.

On the semis the application includes silver panels 6 in. wide, applied on the curved front corners,

with the name "WERNER" and the truck number painted on the reflective sheets with No. 7½ blue. The side of the semi carries an arrow nearly the full length of the body, with the edges of the arrow reflectorized with 1-in.-wide strips of blue. Framed inside the arrow is the name "WERNER" made of cut-out "Scotchlite" silver letters. The rear of the semi is outlined with 2-in.-wide strips of silver around the sides and top, with a "WERNER" panel extending across the back and a smaller panel, immediately below, carrying the truck number.

Throughout the application, the Werner Co. used wide-angle "Scotchlite." Although both wide-angle and regular "Scotchlite" reflect directly back to the source of light, the wide-angle material has the additional value of reflecting brightly from all parts of a curved surface. It will reflect traffic headlights from any angle of approach up to about 80 deg. to either side of head-on. The "regular" reflects to a motorist approaching only from an angle of zero to 15 deg. from head-on.

The wide-angle material, available in the "Scotchlite" factory-coated sheeting, was preferred because of the curved surfaces that were to be covered, and because of the desire to achieve maximum reflective protection for the truck at all times, whether moving on a straight-away, or turning, parking or backing.

Two types of applications were tested—use of a sheeting pre-coated with a pressure sensitive adhesive, and use of a sheeting applied with a separate "Scotchlite" adhesive. (The pre-coated variety is available only for the wide-angle product.) The Werner Co. settled on the pressure-sensitive sheeting, on the ground that it is easier to apply.

However, 3M laboratory men pointed out, where large areas are to (TURN TO PAGE 104, PLEASE)

JUMBO SAYS . . .

**JUMBO ADD-A-BINS
COME COMPLETE
WITH STOCK**

**AND DON'T FORGET
THEY INTERLOCK**

NOTICE HOW THEY INTERLOCK

6½" long - 3¾" wide
3¼" high

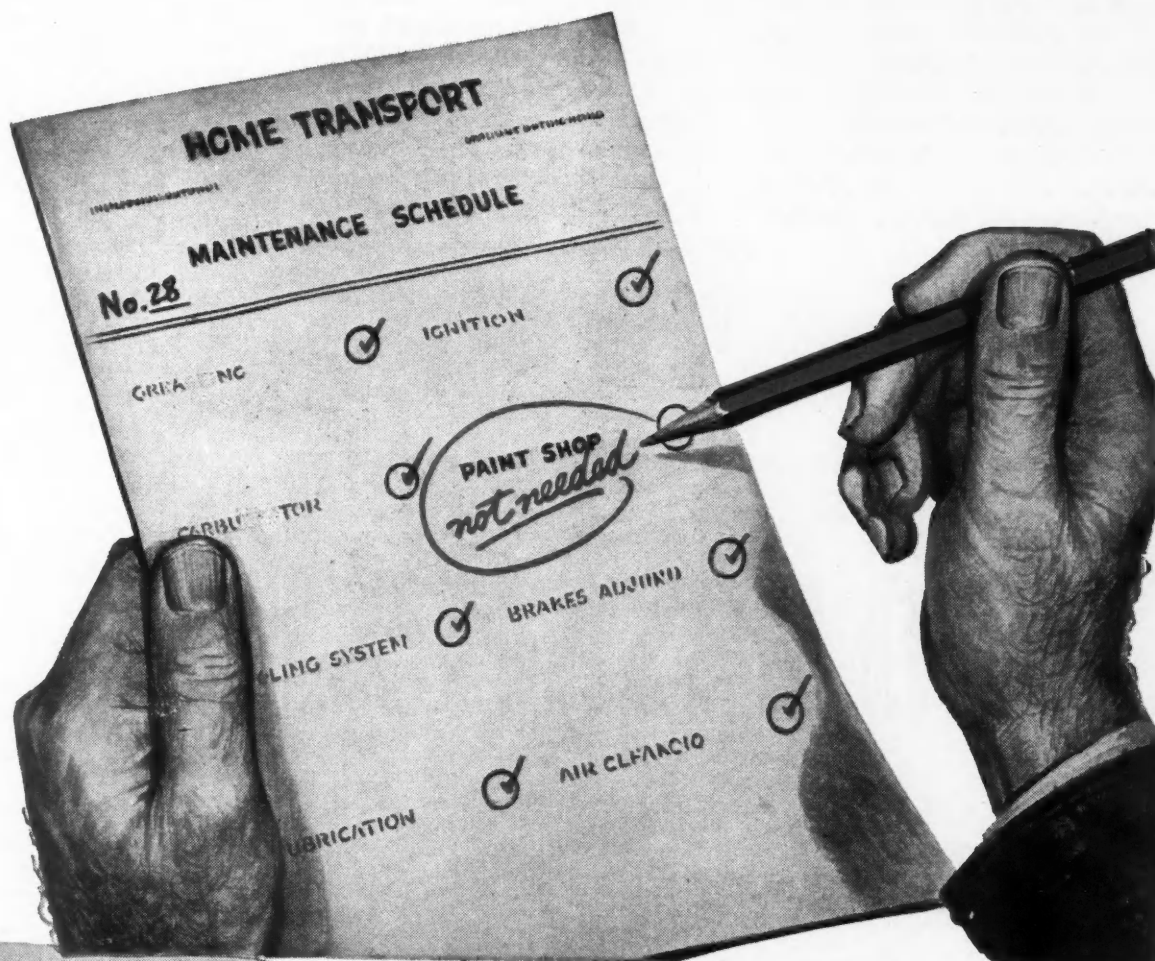
Yes sir,
we elephants never forget - -
and don't YOU forget that
when you buy small parts, buy 'em
complete with a place to stock 'em -
in a DORMAN JUMBO "ADD-A-BIN."
These interlocking steel bins come
filled with any one of over 4000 Dorman
Products - - - Cap Screws, Nuts, Stove Bolts, Lock Washers
Flat Washers and Cotter Pins, just to name a few.
Here's the modern way to BUY AND STOCK your small
replacement parts. Now available from your automotive
wholesaler. - - As. Jumbo Says: "THEY INTERLOCK!"

The Quality Line That's Easy to Find

DORMAN PRODUCTS Inc.
CINCINNATI, OHIO



"DULUX" Gives Protection Plus!



*...measure it in
miles and years!*

You find fewer candidates for the paint shop when your fleet is protected with tough, durable "DULUX" Enamel! For years the No. 1 choice of fleet operators, "DULUX" proves itself *on the road*—by keeping its handsome gloss and color longer, despite severe weather and rough handling.

It's this *extra wear* that spaces your re-paint jobs at wider intervals. You can measure it in miles or years—or in good, hard dollars! Either way, you'll find it good business to place your order for "DULUX" today.

E. I. du Pont de Nemours & Co. (Inc.),
Refinish Sales, Wilmington 98, Delaware.



DU PONT

REG. U. S. PAT. OFF.

DULUX

Reg. U. S. Pat. Off.

AUTOMOTIVE ENAMEL

BETTER THINGS FOR BETTER LIVING
... THROUGH CHEMISTRY

Reflective Materials

(CONTINUED FROM PAGE 102)

be covered, as in the case of a barricade-type application on the rear end, the uncoated product may be preferred. The pre-coated "Scotch-lite" involves an immediate, tight bond, the moment it is applied, requiring careful application. With widths of 6 in. or less, this involves no difficulty. But with larger widths,

use of a separate adhesive is recommended to insure satisfactory results. (The adhesive is provided without charge.)

Application with a separate adhesive is accomplished by spraying or by flowing the adhesive from a brush on to either the "Scotchlite" or the surface to be coated. It should dry for 15 to 25 min., until the adhesive remains tacky to the touch but does not stick to the fingers. Then apply the material lightly. If it is incorrectly positioned, it can be removed by a

sharp jerk, prior to rolling it down.

Once applied, "Scotchlite" is permanent, can be removed only by use of a commercial stripper. Recommended for the purpose is Kleen Strip, made by William Barr Co. of Memphis.

Noerr Experience

COMMENTING on his use of the Prismo process, Floyd B. Noerr of F. B. Noerr & Son, a common carrier firm, Lewistown, Pa., had this to say:

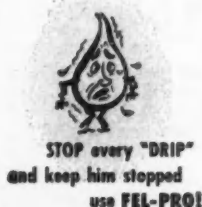
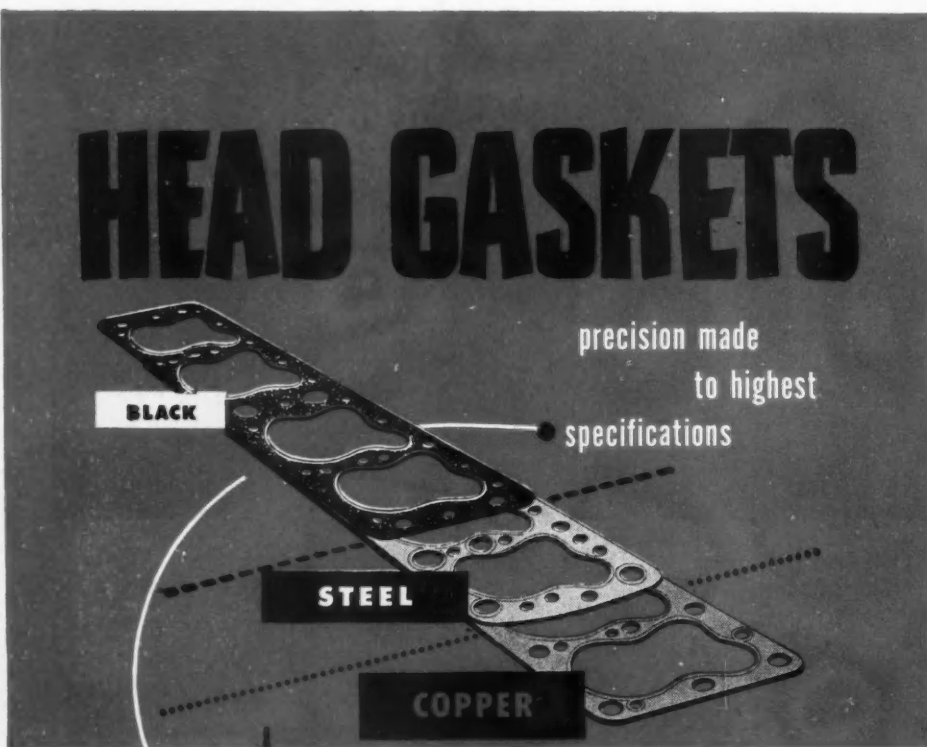
"Prismo reflective material was first applied to one of our trailer units on an experimental basis just one year ago. Increased visibility of the unit at night was at once apparent and the added safety factor is obvious. After a year of use, including both summer and winter operation wherein the unit was subjected to all elements and regular periodic washing, we are entirely satisfied. Wear on the reflective surface is negligible and we expect shortly to equip many of our over-the-road vehicles with the product.

"As will be noted in the accompanying photographs the application on our trailer includes diagonal striping on the tail gate, a broken line around the lower edge, front corner marking and name plates.

"Even when walking in a dimly-lighted parking lot where this trailer is parked alongside others not coated with the reflective material, the effect is at once notable, as the trailer stands out in sharp relief. We believe the product is very worthwhile from the safety standpoint."

END

(Please resume your reading on P. 60)



Whatever the job, when you ask for Fel-Pro Gaskets you can match original head gasket equipment or use your special favorite—be it black, steel or copper. You can get those Fel-Pro black, steel or copper head gaskets individually, in Valve Grinding Sets or in Full Gasket Sets. They're compression-tight, leak-proof, uniformly dependable, preferred by thousands of manufacturers and tens of thousands of repair shops all over the world. Fel-Pro Gaskets satisfy the highest specifications of America's leading engine manufacturers and meet your highest expectations of extra value in gaskets.

FULL GASKET SETS, PACKINGS, GREASE RETAINERS



FELT PRODUCTS MFG. CO. 1520 CARROLL AVENUE • CHICAGO



Toll Roads

(CONTINUED FROM PAGE 48)

are part of their business expenses.

In the third place, because free roads paralleling turnpikes must someday be improved to handle regular traffic demands, despite the above-mentioned state unwillingness to do so, the turnpikes ultimately face financial trouble. A toll road can only draw traffic when it offers the vehicle operator conditions much better than those on free roads. When the paralleling free road, in time, comes to rival the turnpike's advantages, the turnpike faces financial disaster.

What will happen when toll roads go broke, as most of them can be expected to do, soon or later? Why then, the states in all probability will have to take over their debts. An unfortunate aspect of this is that most toll roads are built with bonds issued at a higher interest rate than would be available if they were a direct state obligation. If the state takes over the toll road, it takes over not only these high-interest bonds, but it also takes over a stretch of road that may not be practically engineered for free-road use, and that may require new expenditures to make it generally useful.

If this is the ultimate fate of some of the toll roads being considered today, thoughtful men may well wonder why states don't avoid the whole process and build the needed roads with their own credit, if that is the alternative.

(There is, of course, great question whether that is the only alterna-

tive to toll roads. Highway users are more than paying their way in this country today. In the past, the taxes they pay have proved adequate to buy adequate roads. Many believe they are sufficient today, if the funds do not fall victim to diversion and dispersion.)

Toll roads pose another immediate and major problem. They may interfere with completion of the great proposed Interstate System of free highways.

This system, which is to be built

with Federal and state funds, would make toll roads unnecessary, because it meets all the problems of traffic and congestion and road improvement that toll roads are supposed to meet. But in at least two states, existing or proposed toll roads would lose traffic to such competition. As a result, vital links in the Interstate System may not be built.

If this happens, everybody loses—including those two states.

END

(Please resume your reading on P. 49)



GATKE Custom-Bilt BRAKE BLOCKS and LINERS

for
Cars • Buses • Trucks
Tractors • Trailers and
all other equipment

On mountain roads or desert runs, long hauls or heavy traffic GATKE CUSTOM-BILT Brake Blocks help maintain schedules and reduce maintenance cost.

The smooth, non-grabbing action adds countless miles to tire life with reduced strain on drivers and equipment.

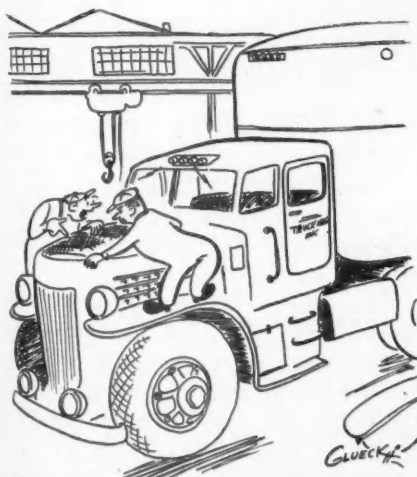
Dependable holding power at all service temperatures—no letdown in heavy traffic or long grades.

The Extra Wear Life keeps brakes safe for the road with fewer adjustments and reduced maintenance.

Make this simple TEST. Use GATKE CUSTOM-BILT Brake Blocks for your next five relines and compare results.

Ask your GATKE Jobber or write.

Gatke BRAKE LININGS
CUSTOM-BILT
BLOCKS SETS ROLLS SHEETS
GATKE CORPORATION
248 N. La Salle St., Chicago 1, Ill.



"I'm sure he's in there somewhere—
I heard a voice!"

Centralized Equipment Control

(CONTINUED FROM PAGE 39)

to service floor, between service line or floor and the dock are made except as directed by the Equipment Coordinator.

The Coordinator normally reports for work at 3 a. m. daily. He immediately lists all equipment presently within the area on his equipment register, noting thereon the load and

whether LTL, frozen, full load or empty.

The "Big Board"

THIS "equipment register" is really in three parts. First there is the "big board" which forms the heart of the system. As will be noted in the accompanying illustration (Fig. 1) it is arranged to correspond with the actual lay out of our Portland property. A numbered tag is provided for each vehicle and sufficient pegs are provided in each area

so that tags may be placed to correspond with the vehicle's actual location at all times.

The term "H. H." in the upper left hand corner stand for Heavy Hauling Equipment (e.g., flatbeds, lowbeds and equipment needed for crane-loading, etc.). The blocked out area below merely signifies executive office space. The blocks labeled "City Pick-up on Line Rigs" and "City Deliveries on Line Rigs" registers the over-the-road equipment being used for pick-up and delivery of large shipments. Local pick-up and delivery units are excluded from the Coordinator's control. A separately colored tag is used to indicate equipment licensed in each of our five zones. When a piece of equipment is under way its tag is removed from the main board and placed on one of the five zone panels, two of which may be seen at the extreme left of Fig. 1.

The other two parts of the registering operation consist of appropriate entries on Forms 665 and 676 (Figs. 2 and 3) one indicating arrivals and departures at the shop, the other at the dock. As will be noted in the actual entries shown, the two forms must correspond, line for line.

Methods of Tabbing Equip.

GETTING back to the functions of the Coordinator, to arrive at the equipment within the area when he goes on duty; the Coordinator registers all equipment, as reported in on the daily schedule and loading report that arrives after the last outbound schedule departs. As a check on this figure, he compares this with the list of inbound equipment prepared informally by the night hostler which shows unit number and type of load.

After 4 a. m. and until he goes off shift, the unloading foreman checks each inbound unit at the scale house and reports unit numbers and type of load to the Coordinator. After the unloading foreman goes off shift, the floor foreman checks arrivals and reports as above.

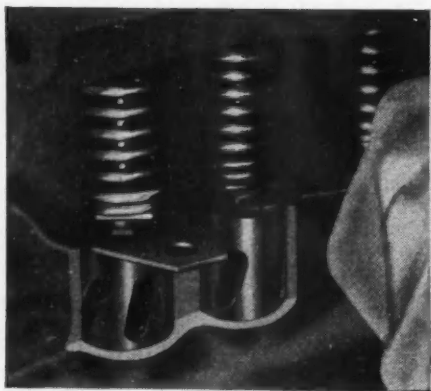
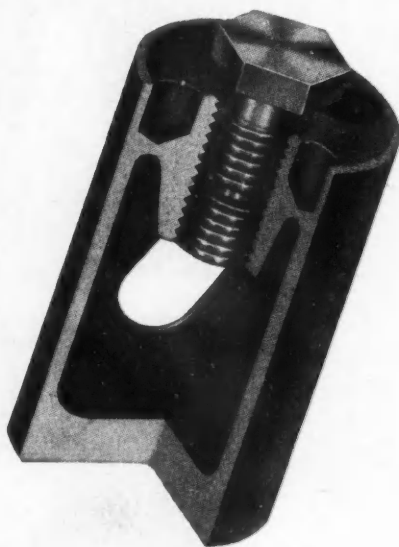
Beginning at 4 a. m. when the service line goes into operation, the Coordinator routes across the service line enough units to fill the pits, choosing these with the thought in mind of clearing as many to the dock for unloading as possible, be-

(TURN TO PAGE 110, PLEASE)

V-8 VALVE JOBS MADE EASY!

WITH *Johnson*
**ADJUSTABLE
TAPPETS**

Do the job right! Install Johnson Adjustable Tappets in Ford and Mercury V-8's (85-100 HP engines). No expensive shop equipment is needed. Installations are made in half the ordinary time and without the task of fitting valves. Special spanners are included with each set of tappets, leaving both hands free for quicker and more



accurate adjustments. Each tappet maintains its setting and gives many thousands of miles of superior engine performance.

The millions of Johnson Tappets in use today are giving dependable service and providing smooth, quiet engine performance.

You'll find that you will make larger profits and gain more satisfied customers when you install Johnson Adjustable Tappets.

AVAILABLE AT N.A.P.A. WAREHOUSES AND JOBBERS

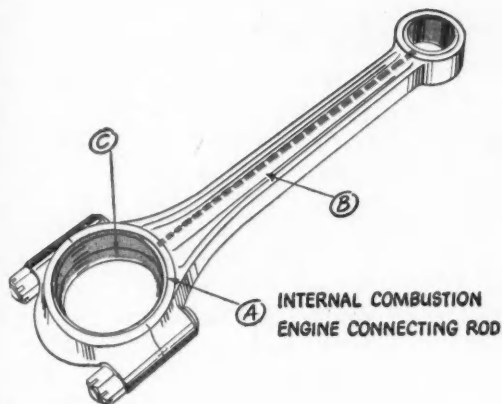
Johnson PRODUCTS INC.
MUSKEGON, MICHIGAN

"Tappets Are Our Business"

STANDARD ENGINEER'S CASE FILE



CASE 1018—PROLONGING BEARING LIFE IN HEAVY-DUTY ENGINES.

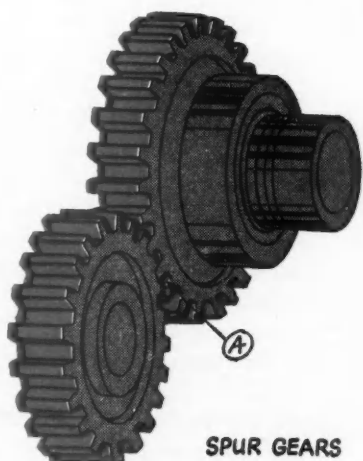


In toughest operating conditions, specially compounded RPM Heavy Duty Motor Oil maintains lubricating film on bearings. For both gasoline and Diesel engines. Comes in five grades: SAE 10 to SAE 50.

- A. Contains anti-corrosion compound. Won't pit or honeycomb copper-lead, cadmium-silver or any other bearing metals.
- B. Detergent keeps all oil passages and parts clean. Assures adequate supply of oil to all bearings, prevents ring-sticking and slow action of parts.
- C. Adherence to metal surfaces, whether hot or cold, minimizes both running and starting wear. Film stays on idle parts and protects against rusting.

Other compounds in RPM Heavy Duty Motor Oil and natural qualities of selected base oils resist oxidation, formation of sludge and prevent foaming.

CASE 1027—LUBRICATING GEARS WHERE MANUFACTURER REQUIRES STRAIGHT MINERAL OIL.



Highly stable RPM Gear Oil did not form objectionable deposits in cases in toughest operating conditions. Recommended for both marine and automotive power-transmission gears requiring uncompounded lubricant. Comes in three viscosity grades: SAE 90, 140 and 250.

Made from the finest paraffinic lubricating stocks. Resists high pressures and temperatures and rapidly carries away and dissipates heat.

Inhibitor breaks up air bubbles - prevents foaming and helps resist oxidation.

- A. RPM Gear Oil sticks tight on gears, and bearings in gear sets and extends their lives - oil film cushions shocks, prevents metal-to-metal contact and reduces wear.

The several grades of RPM Gear Oil provide lubricant for different seasons and climatic conditions.

For additional information and the name of your nearest Distributor, write

**STANDARD OIL COMPANY
OF CALIFORNIA**

225 Bush Street, San Francisco 20, California

The California Oil Company

30 Rockefeller Plaza, New York 20, N. Y.

The California Company

17th and Stout Streets, Denver 1, Colo.

Standard Oil Company of Texas

El Paso, Texas



Trademarks Reg. U. S. Pat. Office

Centralized Equipment Control

(CONTINUED FROM PAGE 108)

fore 6 a. m. Units with LTL and rush deliveries are routed across first. The empties are kept in reserve on the service-ready line to fill in whenever a slack period manifests itself.

Arrivals later than 6 a. m. are immediately classified as to type of cargo. Light loads and rush ship-

ments should be routed to the dock and immediately stripped for release to the shop. Empties should be placed on the service-ready line.

A careful watch on the flow of units through the shop must be kept by the Coordinator in order to keep the flow steady. More units than can be handled quickly should not be released to the dock prior to service. This holds true of the shop.

The hostlers move equipment only upon orders from the Coordinator. The only exception is on moves from

the service line to the service floor which may be ordered by the service floor foreman, and from one stall to another at the dock which may be ordered by the dock foreman or one of his assistants. The Coordinator designates areas in the South lot for the parking of full loads, rush loads, empties and out of service equipment.

Each morning the Coordinator confers with the service floor foreman to determine the time necessary for service and/or repairs on each unit for that day. He then confers with the equipment foreman on the dock to determine the time required for unloading or delivery. He then notes, under the appropriate column, the priority of dispatch on form number 450 (Fig. 4) which should be the approximate time the unit will be serviced and unloaded and ready for final release for loading.

As a general rule, 1 hr. and 15 min. should be allowed for service of a unit. If the mechanical repairs necessary to release the unit ready for the road can be made in not over 1 hr. and 30 min., including mechanical work, the unit may be moved from the service line to the floor without direction from the Coordinator. This move must be effected immediately after service work is completed. If a longer time is required, the additional time must be approved by the Coordinator. This, oftentimes, necessitates the return of a unit for mechanical work after service work has been performed and after unloading at the dock.

Reporting Movements

AFTER the Equipment Coordinator has the available equipment tabulated on his register and the flow is started through the plant, each movement must be reported to him in the following manner through the intercommunication system.

The service floor foreman must report the time each unit is received on the service pits. He then reports the time each unit leaves the grease pits. If the remaining work can be performed within the time limit prescribed above, he does not report the move from the pits to the service floor. He does, however, report the time each unit clears the floor. His report should indicate whether the unit is finally cleared or whether it

(TURN TO PAGE 112, PLEASE)

YOU *Save* BY STANDARDIZING

on Airco Nos. 87, 90 and 230 Electrodes

(A.W.S. Class. E6011-12-13)

Here are three A.C.-D.C. electrodes that meet approximately 61% of all general-purpose, mild steel welding requirements of garages and repair shops.

Airco No. 87, 90 and 230 produce weld metals of high mechanical properties. Their excellent slag coverage results in an unusually smooth deposit, with easy slag removal. Airco No. 230, for example, has a specially formulated coating that produces a spraying type of arc. This is of great assistance in the performance of vertical and overhead welding, permitting high welding speeds with excellent deposits.

All three electrodes are recommended for normal or high-speed welding in the flat, vertical or overhead position and are known for their:

- ... Low Spatter Loss
- ... Light, Easily Removed Slag
- ... Unusual Smooth Weld Deposits
- ... Excellent Operating Characteristics

But learn all about these general-purpose electrodes for yourself. Ask for Airco Electrode Catalog No. 120A. Just fill in and mail the coupon for your copy. Address: Air Reduction, General Offices, 60 East 42nd Street, New York 17, N. Y. In Texas: Magnolia Airco Gas Products Co., General Offices, Houston 1, Texas. Represented Internationally by Airco Export Corp.



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Headquarters for Oxygen, Acetylene and other Gases . . . Carbide . . . Gas Welding and Cutting Apparatus and Supplies . . . Arc Welders, Electrodes and Accessories.

CJ

Air Reduction
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New York 17, N. Y.

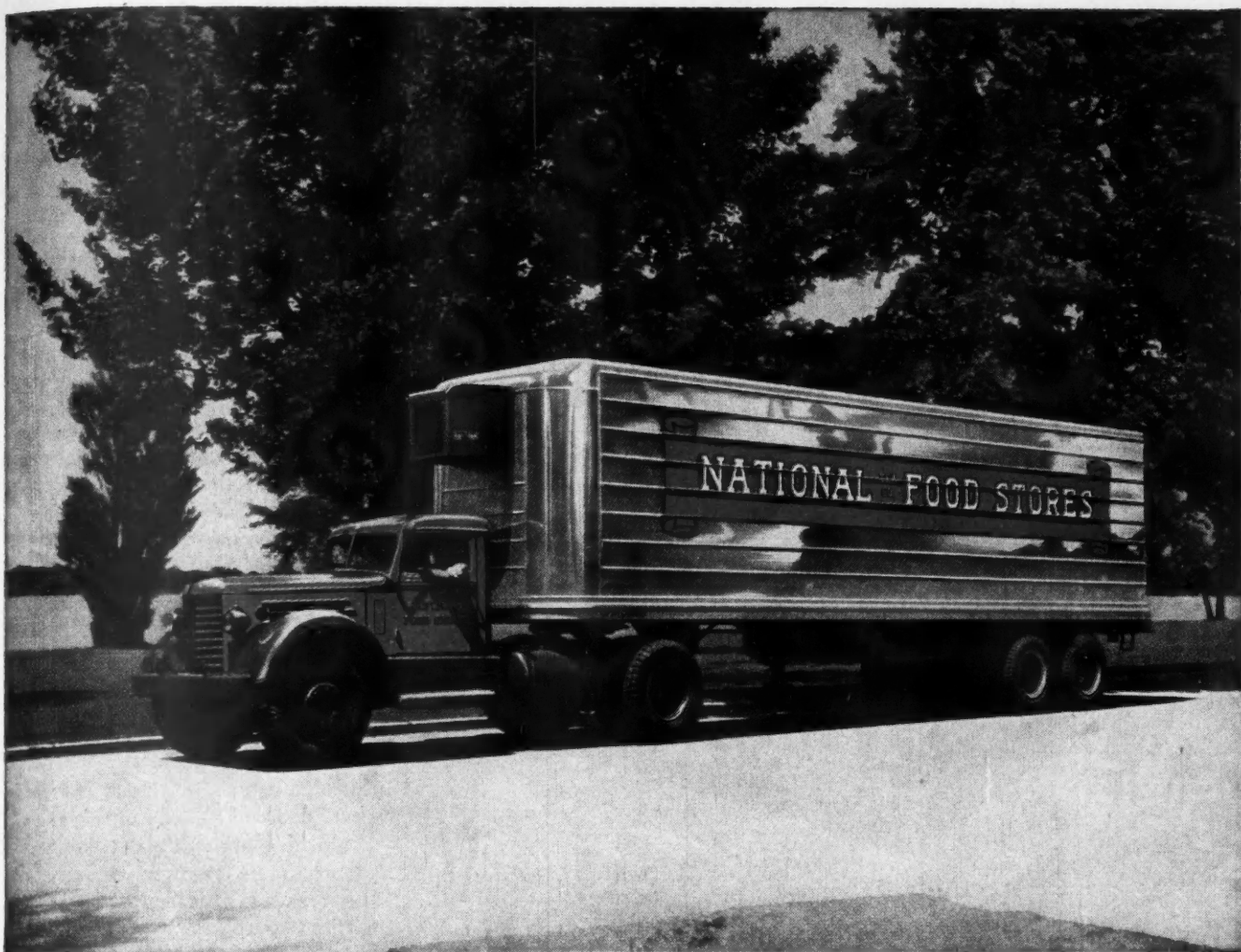
Please send me the Airco Electrode Catalog No. 120A.

Name.....

Firm.....

Address.....

City.....Zone.....State.....



More "Frigid Freight" rolls in these Lightweight Brown Trailers

• "We consider Brown Aluminum Trailers the very finest equipment available today for hauling perishable food products," reports the National Tea Company. And to prove that they mean it they have just added 10 new Brown Aluminum Trailers to their fleet.

Durability, general performance and weight saving are the reasons for their choice. A Brown is the lightest, high-quality trailer you can buy. Lightweight aluminum alloy plus frameless, airplane-type monocoque construction makes a Brown as much as 20% lighter than most conventional lightweight trailers. Take a minute to figure for your-

self what this extra weight in the payload will mean in profits for you. For complete details on Brown Aluminum Trailers see the Brown representative in your area or write us.

Brown Trailers are insulated with 3" of fire resistant cotton that is 2 to 10 times lighter than most standard insulation. The natural reflective qualities of aluminum create additional insulating efficiency.



*The Scale tells
the Tale...Lightweight
means more Freight*



ALUMINUM TRAILERS

**BROWN INDUSTRIES
Spokane, Washington**

Sales and Service in: Seattle, Spokane, Los Angeles, San Francisco, Denver, Minneapolis, Kansas City, Chicago, Salt Lake City, St. Louis, Ft. Worth, Jacksonville, Great Falls, Akron

Centralized Equipment Control

(CONTINUED FROM PAGE 110)

must return and the approximate length of additional time required.

When the shop releases a unit to the dock, the dock in turn reports the time received and to which operation assigned (e.g., unload at dock or city delivery), also approximate time involved. The Coordinator advises whether the unit must re-

turn to the shop and for how long. The dock must promptly report to the Coordinator all units that are emptied. The elimination of delay in reporting empties as soon as unloaded is extremely important.

A unit dispatched on a city delivery must be reported and the time dispatched. Upon its return the equipment dispatcher reports it in to the Coordinator. The same holds true on city pickups.

The Equipment Coordinator records all times on his register. If a

unit is longer than the estimated time as given by either the service floor foreman or the equipment dispatcher, the Coordinator will check on its movement through the intercommunication system.

The success of this system depends on current, accurate time reports being given on all movements by the shop and dock. No equipment must be allowed to remain on side streets or alleys around the terminal, or at the dock or the shop without reporting, immediately. City drivers must be properly instructed and impressed with the need of reporting delays and arrivals. Hostlers must keep very much in evidence and be used for no unauthorized moves.

The Portland Transport Dispatcher should line his equipment up for the day's dispatch only after conferring with the dock foreman and the Equipment Coordinator. In this connection, special attention must be paid to the column headed "Dispatch Priority" on form 450. Wherever possible, equipment, upon which a great deal of work is necessary, should be sent on a short run (e.g., Kennewick on Montana equipment). This brings it back early the second morning and allows two full days for the shop. After units are once allocated to schedules, no change will be made by either the dock or dispatcher, without approval from the Equipment Coordinator.

In the assigning of equipment on runs, the dispatcher will be governed strictly by the latest equipment list showing the zones in which the equipment is licensed for operation.

Priority Runs

PRiority must be given the long schedules, particularly those operating to Montana which transport all freight for Minneapolis, Chicago and beyond. If delays are necessary, the shorter schedules such as Oregon local or Seattle (6½ hr.) must suffer.

We are constantly experimenting with new ideas to increase the efficiency of the Control Room, and at the same time aid the shop and dock in the problems that continually confront them. Changes are being made in work schedules both in the shop and dock to fit the ever-increasing demands for better service to the customer.

END

(Please resume your reading on P. 40)



Another Moog Triumph!

FULL DRESS for FULL POWER

To fully emphasize the Extra Quality and Outstanding Performance of Moog X-Plus Full Power Piston Rings, a smart, colorful new metal foil package packs the Full Power set-up. Truly, *tomorrow's rings today* in tomorrow's package today!

See the best looking package for piston rings... Try the best performing piston ring... Give your customers a Full Power overhaul backed by 10,000-mile or one-year guarantee. Order from your jobber.



MOOG PISTON RING COMPANY

Division: MOOG INDUSTRIES, INC. ST. LOUIS 14, MO.

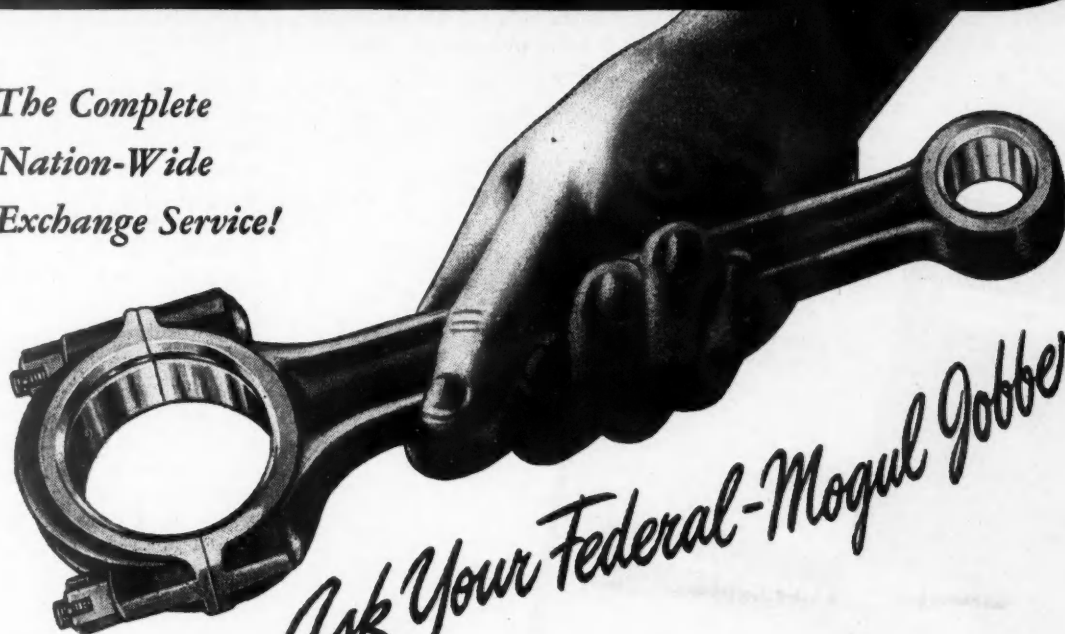
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*Prompt
Accurate!*

CONNECTING ROD EXCHANGE SERVICE

Rebabbitted • Reconditioned

*The Complete
Nation-Wide
Rod Exchange Service!*



This convenient Federal-Mogul service provides you with both rebabbitted and reconditioned rods that are restored to original specifications. ¶ Rebabbitted rods have new piston pin bushings. Pure new babbitt is securely bonded in place, accurately machined, with oilways carefully regrooved. Reconditioned rod forgings have bores that

are truly round, refinished accurately and smoothly for new precision insert bearings. ¶ You can buy these rebabbitted and reconditioned rods outright or on an exchange basis for popular numbers. It pays to use flawless rods. Ask your Federal-Mogul Jobber!

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COLDWATER, MICHIGAN

When Performance Goes up in Smoke



**Replace in Sets with Genuine
FEDERAL-MOGUL
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*The complete line—over
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Engine Bearings • Bushings •
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Shims • Solders.

Splash Guards

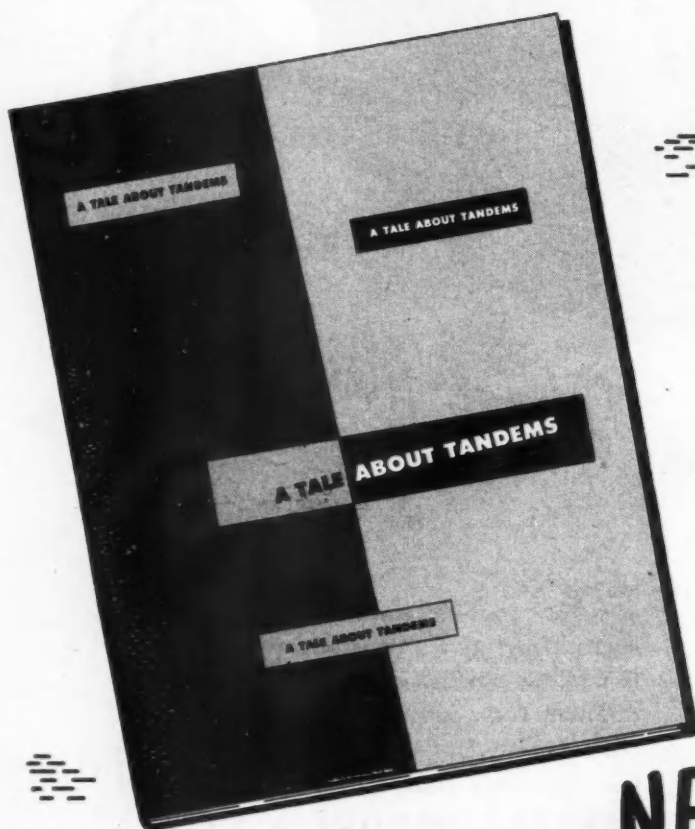
(CONTINUED FROM PAGE 35)

The conventional guard used is one designed by Kenworth. It extends back 6 ft over the set of four wheels, angles down 45 deg for 24 in. over the rear wheels, and then drops 14 in. to the required 16 in. from the ground. Rear wheels of the truck and the trailer are equipped alike.

Still another type of guard is that used on dump trucks. Of the ten

dump truck fleet operators queried, three used canvas for their guards, two used leather, one belting, and four used the rubberized war surplus material described above.

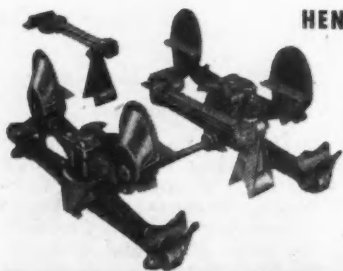
The size of the guards and method of installation was pretty much standardized: Guard, 23 in. wide; 26 in. long (length differing with the make and size of truck). In most cases the guard is bolted to a steel cross member, using a metal strap 1 in. wide and from 1/4 to 3/16 in. thickness—four bolts to each guard.



NEW!

This well-illustrated, 16-page booklet, written in non-technical language, has been designed and produced to tell the TANDEM story simply and pictorially.

A request, and the booklet is yours without obligation.



HENDRICKSON MOTOR TRUCK COMPANY

Wabash Avenue at 36th Street
Chicago 15, Illinois



Follow the Leader!

What Operators Think of Their Splash Guards

Few of the fleetmen questioned were very enthusiastic about their splash guards. Some of them, particularly the dump truck users, felt that the guards materially hampered their operation. On the other hand, one very large over-the-road freight operator had been using guards long before they were required by law.

When asked directly whether they felt the guards were an added safety factor, however, all said "no." Commented one: "If you are close enough to a truck in the rear to have spray thrown on your windshield, you are too close for safety!" Said another: "With splash guards it is impossible to pass a truck in wet weather without having your windshield splattered with the side angle flush forced out by the guard."

Another was more explicit: "I have come to the conclusion that we must do something more than installing fenders or flaps . . . reduced speed in wet weather is the answer . . . This is difficult but we have a bonus system that gets our drivers to give us some cooperation . . . I have little faith in flaps or fenders but I do believe they have a public relations value. I personally recommended passage of the bill before the committee at the Oregon Legislature for this reason only."

No dump truck fleet operator reported the guards a success. They blocked view in backing, caused side splash, and were of no value in preventing rocks from flying back on gravel roads.

Same Story In Oregon

THE law became effective on Sept. 1, 1947. Notification was not by letter but through the press. The regulation covers all trucks except: "A motor truck chassis not equipped for hauling a load, or a truck equipped with bunks (a logging truck)."

It requires that the splash guard come down to within 10 in. of the surface of the highway when the vehicle is empty for all motor trucks not equipped with a body. The law (regulation) goes on to require:

The words "Logging Trucks" were not included in the exemption and it (TURN TO PAGE 116, PLEASE)

"Now I understand Why the country's top fleets depend on Daytons for real service!"



Over 50% of the fleets winning maintenance awards in 1947 specified Dayton Truck Belts!



For that extra margin of service on all accessory truck drives—Daytons are Champion Milers! *Raytex-Fortified* with specially-processed Dayton rayon cord—Daytons outperform all others, even on the toughest hauls. For instance: The Capital Transit Company of Washington, D. C., winner of the Bus Transportation Maintenance Award for 1947, reported that Daytons averaged approximately 35,000 miles per belt on its fleet of 1015 buses. A bonus of 14,900 miles over the life of the average public utility bus belt, as shown by a recent survey!

Take advantage of this Dayton bonus of mileage and service. Get the facts from your jobber, or write direct to *Dayton Rubber, Dayton, Ohio.*

TRUCK BELTS by
Dayton Rubber

THE MARK OF TECHNICAL EXCELLENCE IN NATURAL AND SYNTHETIC RUBBER

For Service That's Traditional with Truckers

Splash Guards

(CONTINUED FROM PAGE 114)

required a ruling of the state's attorney general to exempt these, which was given in the following paragraph:

"It is my opinion, therefore, that logging trucks equipped with bunks are excluded from the operation of chapter 550, Oregon Laws 1947 . . . (signed) . . . George Neuner, Attorney General."

According to the State Highway Department of Oregon, splash guards were installed on 90 per cent of all vehicles covered by the law before the law became effective.

Six oil transport fleet operators in Oregon were interviewed as to kind of material used and method of installation and also as to the value of the guards.

Four of the six used light weight (3/64th in.) aluminum sheet for the splash guard frame above the guard, fastened on to an angle iron frame

with 5/8th in. heating hose, split and riveted through the angle iron frame and the aluminum. The splash guard itself was made from composition shoe sole material manufactured for the Russian Army during the war. This composition leather comes in sheets 24 by 24 in. square and it requires 3 sheets to make two guards. These guard flaps can be made from this material for approximately 75 cents each. However the complete installation, including labor runs around \$25 per set of two guards.

Six motor freight operators were queried. Of these, three used the composition shoe leather material. One used the surplus airplane rubber, dressed up for appearance, stability and reflective value, with stainless steel strips. Another used canvas, and one operator had purchased a supply of war surplus belting.

All those queried used the same method of installation. The splash guard was bolted to cross member of the frame on the truck or trailer.

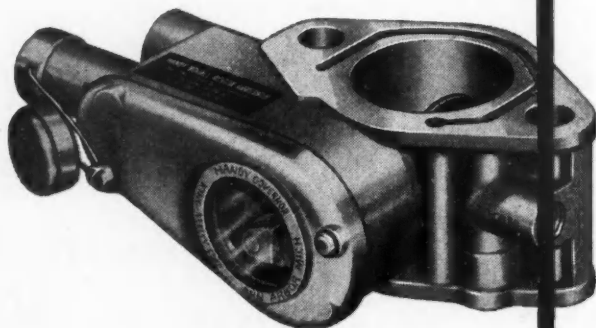
The Ross Island Sand and Gravel Co. of Portland was the only pre-mix concrete fleet operator queried in Oregon. For their mixer trucks, a metal frame 10 in. high and 26 in. wide was made for both sides from 3/16th in. sheet metal. A reflector of 3 1/2 in. diameter was mounted in the outside corner of each frame. A metal strip 3/16 in. thick, 1 1/2 in. wide and 24 in. long is used with four bolts to fasten the splash guard, which is made of second-hand belting. All metal used was scrap. The splash guard hangs down to within 16 in. from the ground. Labor charge ran \$5.16 per pair; material brought the total to an average estimate of \$10 per pair.

The Ross Island Co. has had some trouble with the splash guard being torn off in backing and have had to issue special instructions to drivers on this.

So there you have it. Make up your mind as to how you stand on splash guards and if your legislature decides to introduce a splash guard law you will at least know what some of the leading fleet operators in the two Northwestern states think about them.

END

(Please resume your reading on P. 36)



This GOVERNOR

Anger, fatigue, grief, or joy—any one of these can temporarily transform a reasonably good truck driver into a serious traffic menace. This very thing has happened too often to ignore the danger of these human reactions.

The Handy Vari-Speed Governor, however, is not human, is never emotionally involved, but always comes to the assistance of the human driver who is. When your truck fleet is equipped with the Handy Governor, you have good reason to expect fewer accidents, and you will also save on tires, engine repairs, lubrication and brake maintenance.

The Handy Governor costs but a small fraction of what it will save you in its first year of operation.

KING-SEELEY
CORPORATION
ANN ARBOR MICHIGAN

HELPS KEEP the
Emotional Driver
OUT OF TROUBLE

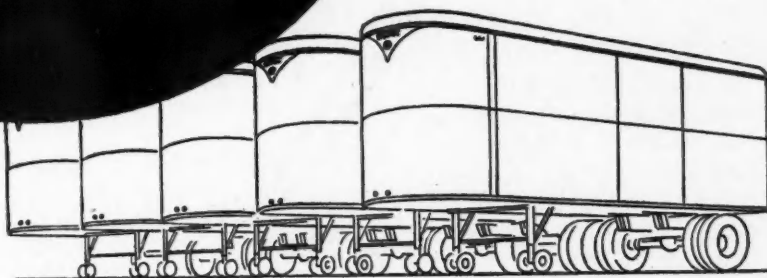


watch
the swing

to

SUPERCARGO

MORE and more, fleet operators are turning to SUPERCARGO for trailers of Advanced Design, Engineered Construction and Production-line Economy.



Only on SUPERCARGO will you find *flexible* torque arms combined with free-floating, quadri-point spring suspension. SUPERCARGO is engineered from the ground up! It's a quality trailer from top to tires!

AMERICAN BANTAM CAR COMPANY, BUTLER, PA.

MANUFACTURERS OF

SUPERCARGO TRAILERS

Scattered Dairy Maintenance

(CONTINUED FROM PAGE 43)

four hours. Labor charge here runs \$7.50 per unit per tune-up, or \$22.50 per year.

Tuneup follows a rigid seven point schedule:

1. Check compression.
2. Put vacuum gage on carburetor and overhaul or replace when needed.
3. Check distributor with dwell

tester and electric tachometer and overhaul or replace if needed.

4. Check timing with electric tester and make necessary correction.

5. Check exhaust with exhaust analyzer.

6. Test battery and electric system with tester.

7. Inspect job and make a written report on all troubles and corrections.

With the "right" equipment we find that by following the above schedule, we can put our finger on the trouble in the least time. By

following the above schedule on all units serviced at our central headquarters, we have been able to extend the time between major overhauls by at least one third. This however would not be possible if we did not have all the equipment necessary in making a correct and complete tune-up check.

Lube Man Is Mechanic

THE man who handles lubrication is a competent mechanic. We believe this to be one of the most important factors to our longer than average time between major overhauls, and lower than average maintenance cost.

Too often the lubrication is turned over to a dollar-per-hour grease monkey. This man does a good enough job on lubrication. But it is our belief that at the time the unit is lubricated it should also be given a careful inspection.

We use a twin post hydraulic lift. This is our grease rack. While the truck is on the grease rack, the mechanic doing the lubrication checks for loose universal joint, broken springs, leaky muffler and exhaust pipe, bolts needing tightening, etc. This procedure is followed every time the unit is lubricated.

While we have no accurate check, we are confident that the PM savings pays more than 50 per cent of the mechanic's salary. And more, we are getting a competent PM check every time the unit is lubricated. This would not be possible if we used a grease man who was not a qualified mechanic as well.

Tires Farmed-Out

WE farm out all tire repair and recapping. We believe that tire work is specialized work and can best be handled by the large, well-equipped shop which is manned by factory trained experts. Since the beginning of the war we have been recapping just as long as the carcass holds up. We leave this to the tire recapping expert. Our war-time experiencing with recapping has been such that we shall continue to recap all good carcasses.

Simplified Records

THE best fleet record system has always been the simple one; the (TURN TO PAGE 120, PLEASE)

ANYWAY YOU LOOK AT IT....

is Outstanding!

NO. 245 TELESCOPIC ADJUSTABLE MIRROR WITH 5" HEAD

- Extends from 19 1/4" to 27 3/4"
- Universal Mounting.
- Adjustable to any position.
- Heavy Steel Tubing.

NO. 238 6" MIRROR HEAD

Write for Catalog

See Your Jobber

SAFETY

High fidelity vision that eliminates tricky illusions. No distortion. Easily adjusted to suit specific "seeing needs" of all drivers.

QUALITY

Over 32 years experience...since 1915. Technical research, up-to-the-minute production methods and painstaking attention to detail. Yankee Mirrors are the finest in the world.

ECONOMY

Built-in-durability, metal parts bonderized, "know-how" in processing mirrors — all add up to keep your replacement maintenance down!

245H—REPLACEMENT MIRROR HEAD
Made to fit the No. 245 Telescopic Adjustable Mirror.

CONVERSION KITS

STOP AND TAIL LAMPS

DIRECTIONAL SIGNALS

YOU'RE SAFE WHEN YOU SEE WITH YANKEE

YANKEE METAL PRODUCTS CORP., NORWALK, CONN., U. S. A.

Fleet Owners, IT PAYS TO DO YOUR PAINTING



Cheaper...Faster...Better... IN A COMPLETE DEVILBISS PAINT SHOP

With a DeVilbiss Paint Shop in your own garage there's no waiting—no delay. Many paint jobs can be done while vehicles are tied up for mechanical repairs. And you get trucks back on the road with less loss in travel time and freight revenue.

In the DeVilbiss complete paint shop every item is designed for a specific job, and therefore produces the best possible result at peak efficiency, yet they all work together as a perfectly coordinated team.

Every day more fleet operators are turning to DeVilbiss for complete paint shop modernization. DeVilbiss is helping them with this modern equipment that gets painting done and trucks out on the road without delay.

THE DEVILBISS COMPANY • Toledo 1, Ohio
Canadian Plants: WINDSOR, ONTARIO

These four essentials comprise the **COMPLETE PAINT SHOP**

1. **A SPRAY BOOTH...** providing adequate exhaust, scientific illumination and positive dust protection.
2. **AN ASSORTMENT OF SPRAY EQUIPMENT...** for factory quality results on all kinds of jobs with any spray material.
3. **AN ADEQUATE AIR COMPRESSOR** ... to provide ample low cost air for all paint shop and service requirements.
4. **HOSE AND CONNECTIONS...** designed and built specifically for spray painting service.

DE VILBISS



means Quality in all four...

SPRAY EQUIPMENT
EXHAUST SYSTEMS
AIR COMPRESSORS
HOSE & CONNECTIONS

Scattered Dairy Maintenance

(CONTINUED FROM PAGE 118)

set up with the least number of forms to be filled out, and one where all the complicated bookkeeping is handled by the accounting department.

We have three forms and a monthly report, the latter being made up by the accounting department.

The first and most interesting form is a mimeographed maintenance rec-

ord sheet for each unit. (See illustration on page 43.) This form gives a complete physical description of the unit and then lists in detail work done on the truck. It is kept posted to date and on file in the shop and all data sent to the bookkeeping department.

The second form is a conventional truck defect report. Each driver carries a pad of them and each evening when he turns in his truck he makes out one of these forms in duplicate. One copy is kept at the repair shop

and one goes to the bookkeeping department. When we have completed correction and repair on this unit, we fill in the bottom half with labor and parts replacement time and cost and send to the bookkeeping department.

The third form is a daily record for the plant filling station. On this form each truck served is listed by number, the amount of gas and oil marked down, and the speedometer reading. After each entry there is a space for the initials of the serviceman who handled the truck. At the end of the day the original of this form goes to the bookkeeping department and a copy to the maintenance shop, where it is filed for later reference.

From the information obtained from the above three forms, the auditing department makes up a monthly truck operating and maintenance cost report. A copy of this report goes to company executives, to the maintenance shop foreman at El Paso, and to the branch managers. The report lists each truck in the fleet, shows the make, number, year; miles traveled for the month, gallons of gas used, miles per gallon, quarts of oil used; dollar cost on gas, oil, grease, and antifreeze; dollar cost on labor and parts, and tires; total operating cost, operating cost per mile; the fixed charge per truck per month, the total cost and the total cost per mile.

The last double page of the monthly report gives a month's summary as to main plant and branches. Below this summary is a similar listing giving accumulated totals for the year.

Having this report to study monthly—a report which gives not only the picture at El Paso but at every branch where we farm out all repair work—has been of great value to us in cutting our overall maintenance and repair cost.

END

(Please resume your reading on P. 44)

DRIVE SLOWGANS

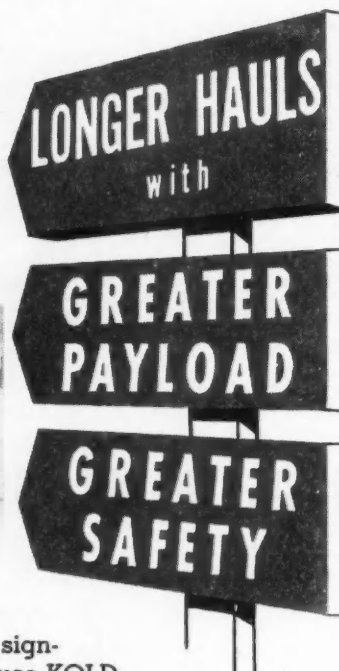
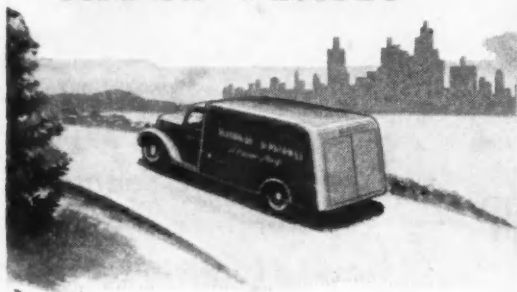
By Buster Rothman

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But don't try to pass 'em on a hill.

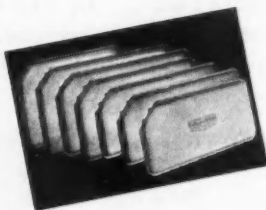
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Kingpin Offset

(CONTINUED FROM PAGE 67)

Clearance Angle

ONE of the liminations which beset radical kingpin offsets is that of clearance angle. By this is meant the maximum angularity in a vertical plane between the frames of the tractor and semi-trailer which will leave safe clearance between the end of the tractor frame and the bottom of the semi-trailer. As indicated in

Fig. 2, the 14-in. offset, at conventional plate height permits a clearance angle of 10 deg., which would seem ample for the worst conditions to be anticipated on the highway.

Traction

MAXIMUM traction is obtained, of course, where the maximum percentage of load occurs on the driving wheels. In a tractor-semi-trailer, assuming that the trailer axle carries the full legal load, maximum traction is secured with zero kingpin offset. In

the first example shown in Fig. 1, the tractor rear axle has 44.7 per cent of the gross weight in this condition and 43 per cent in the third example. If ideal load distribution could be attained, it would have 40 per cent. These differences, of course, are not great, but assuming .6 driving adhesion and 16,700 lb. weight on the driving wheels, as in the second example, the maximum, tractive effort would be 10,020 lb. Under the same conditions, with 18,000 lb. on the driving wheels the maximum tractive effort would be 10,800 lb. Considering the difference in gross train weight in the two instances cited, however, it is seen that the difference is too small to be of consequence.

Braking

UNLIKE traction, braking is affected seriously by weight distribution. In the conventional tractor-semi-trailer, only one axle drives, so that the percentage of load on this axle alone is significant from the standpoint of traction. Braking, however, is on all wheels and so variations in the imposed load on each axle affect the result.

In an ideal braking system, the braking force at all times would be proportional to the imposed load on each axle. So far, no braking system has appeared which is capable of instantaneously varying the braking force on each axle to cope with weight transfer due to inertia and gradient and variations in static loading due to changes in total payload or its distribution in the body. Therefore, the greatest safety may be expected from arrangements in which the variations in imposed loads are least. With the kingpin centered over the tractor rear axle, variations in the static loading of the trailer affect the tractor only at its rear axle, leaving the burden on the tractor front axle relatively uniform. With an appreciable kingpin offset, such variations affect both tractor axles and so produce less overall disturbance of proportionate loading.

Furthermore, advancing the kingpin forwardly reduces the tendency to jackknife, independently of these other effects. When a tractor-semi-trailer jackknifes as the result of a brake application, the tractor rear axle

(TURN TO PAGE 125, PLEASE)



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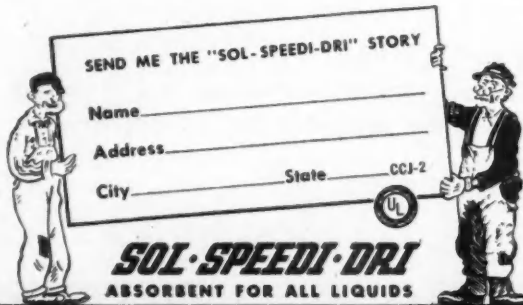
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Kingpin Offset

(CONTINUED FROM PAGE 122)

skids sidewise in response to the toggle action about the kingpin. This skidding is sometimes increased by locking or partial locking of the tractor rear axle brakes which may be the result of excess braking force distributed to them. With a properly offset kingpin, and the consequent proportionate increase in front axle loading with any increase in total weight, the brakes may safely be proportioned to give the front axle a greater share of braking duty, thus reducing the danger of locking of the tractor rear brakes.

In addition, with zero kingpin offset, the sidewise component of the toggling effect originates at a point directly over the rear axle but at a point between the two axles with appreciable offset. In the latter case, the side-thrust is distributed between the two axles and accordingly the resistance to skidding of the rear axle materially increased (Fig. 3).

Summarizing these effects of kingpin offset on braking, it seems justifiable to conclude that both the effectiveness and safety of braking are promoted by a reasonable amount of kingpin offset—as much, in fact, as the limitations already discussed permit.

Steering

OPTIMUM steering must always be a compromise between ease and positiveness. The less weight on the front tires, the more easily the vehicle may be steered, but the greater the tendency for the front wheels to skid on slippery footing. Placing the kingpin directly over the tractor rear axle reduces the labor necessary to steer; but on slippery upgrades in particular, it introduces dangerous uncertainty of response.

As the kingpin is moved forward, the loading of the front axle increases, thus increasing its resistance to skidding and also the work required to turn the steering wheel. As shown in Fig. 3, however, the side-thrust on the front axle is correspondingly greater, since it is now affected by trailer inertia, from which it is virtually free with the kingpin centered over the axle. Fur-

(TURN TO NEXT PAGE, PLEASE)



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Kingpin Offset

(CONTINUED FROM PAGE 125)

thermore, in accelerating there will be a resulting tendency to oversteer and in braking to understeer. These effects will be largely if not completely offset by the increased tire adhesion due to increased burden, so that the net result will seemingly be slightly more effort required for steering with little or no compensating benefit as regards positiveness.

But, as previously noted, a definite kingpin offset does decrease the tendency to jackknife, which to a very real degree represents a steering factor.

Turning Radius

THERE are still other effects on steering which must be considered before we may judge the relative overall effect. It might seem that kingpin offset, to the extent that it pulls the whole trailer forward would shorten the total wheelbase and

hence reduce the turning radius. This would be so if the distance from the kingpin to the trailer axle center were unchanged. But we have seen that as the kingpin is moved forward, some of its load is assumed by the tractor front axle and a corresponding amount is relinquished by the tractor rear axle. To compensate for this, so that the entire additional load on the front axle becomes increased legal gross train weight, the distribution of trailer weight between the kingpin and the trailer axle must be modified, imposing a slightly greater percentage on the kingpin as illustrated in Fig. 1.

This is done either by moving the kingpin or the trailer axle backward with relation to the trailer center of gravity. In the former case trouble may be anticipated both as to cab clearance and trailer throat clearance, so that the preferable procedure would be to move the trailer axle back. The distance which it must move back, of course, depends upon the effective wheelbase of the trailer, but in any case it will partially nullify the reduction in turning radius expected.

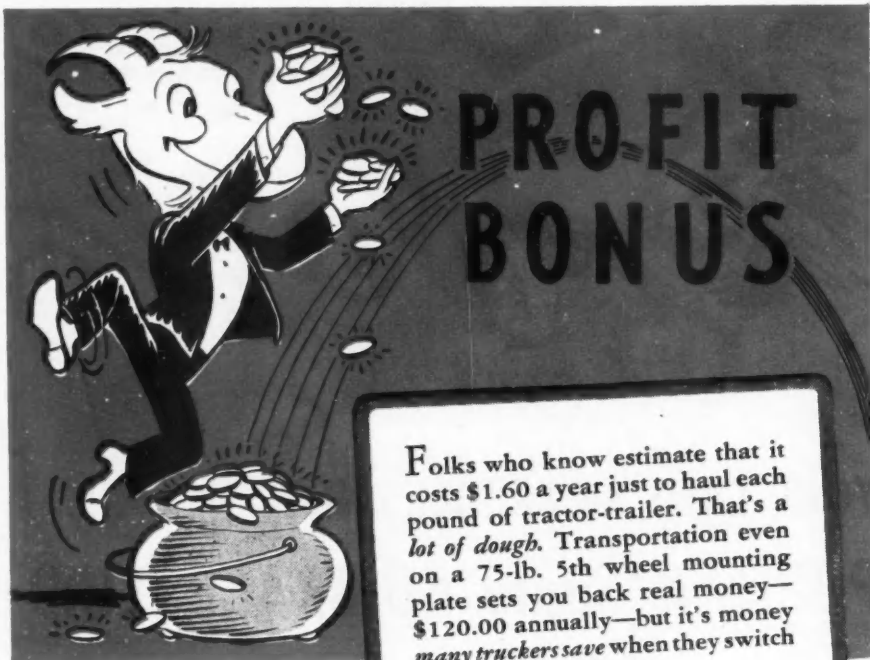
Fig. 4, however, illustrates the noticeable decrease in off-tracking results from a moderate kingpin offset. Since it is the total road width occupied on a turn which determines how sharp a curve or turn a vehicle may negotiate satisfactorily, it will be seen that kingpin offset makes sharper curves and shorter turns practicable.

Maneuvering

CLOSELY related to steering is the factor of maneuvering. Of this maneuvering, backing constitutes the trickiest part. The secret of effective backing of tractor-semi-trailers is to so handle the tractor that it directs the trailer wheels and then follows the trailer. This control is similar to that of a wheelbarrow, in that the direction taken by the trailer wheels is opposite to that toward which the tractor is directed and is controlled by swinging the kingpin from side to side, just as the handles of a wheelbarrow are swung.

With the kingpin directly over the tractor rear axle, this side movement of the kingpin is possible only to the extent that the tractor itself is moved sidewise; but with an appre-

(TURN TO PAGE 128, PLEASE)



Folks who know estimate that it costs \$1.60 a year just to haul each pound of tractor-trailer. That's a lot of dough. Transportation even on a 75-lb. 5th wheel mounting plate sets you back real money—\$120.00 annually—but it's money many truckers save when they switch to Safety 5th Wheels.

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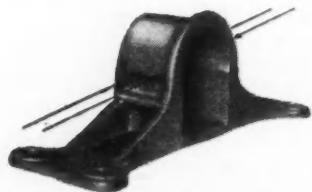
These wheels need no mounting plates. Fixed bracket spacing matches a standard 34" tractor chassis. Safety 5th Wheels are strong; won't "dish"—put weight where it counts most . . . in the working and wearing parts of the husky wheel itself.

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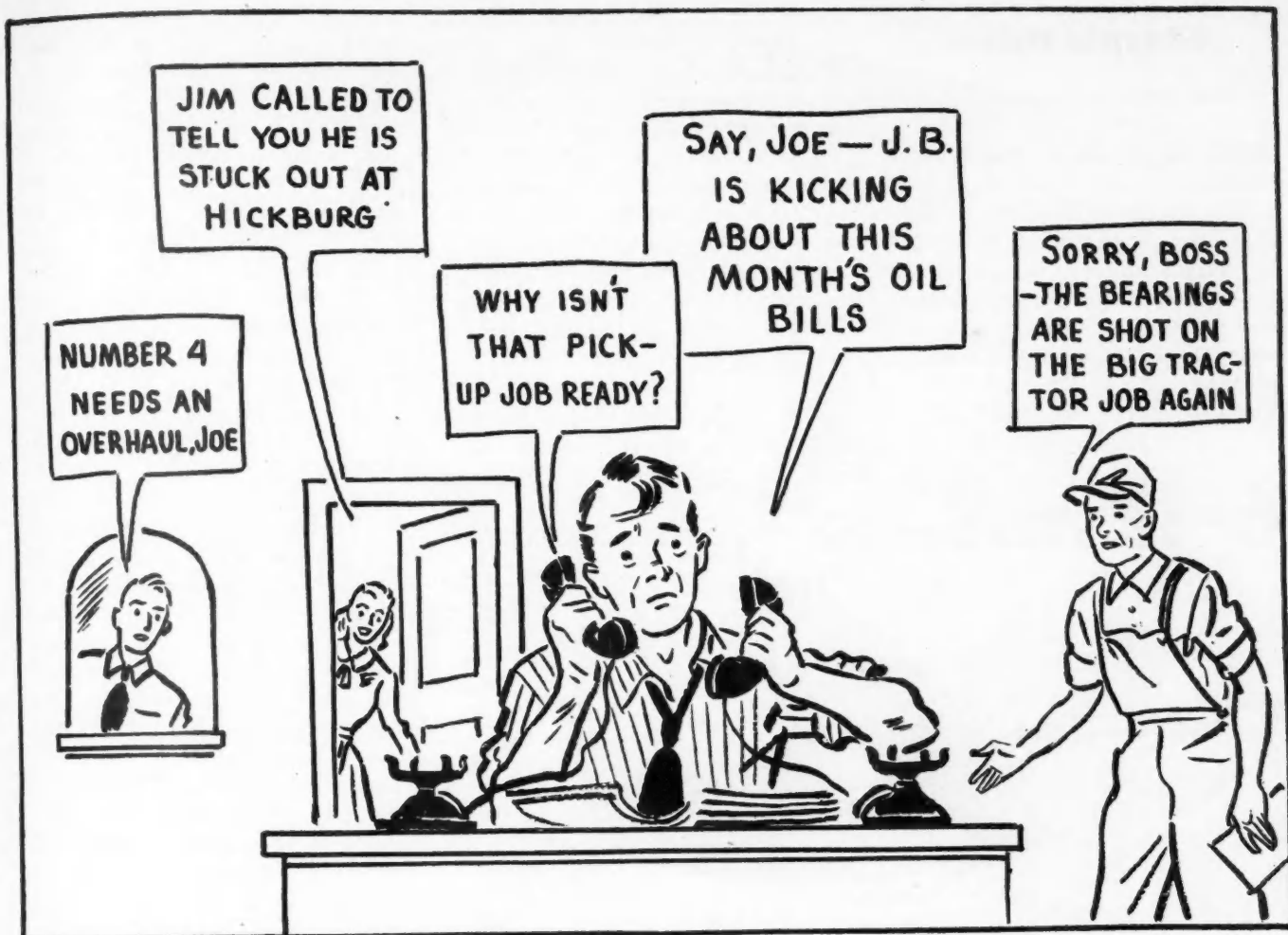


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Kingpin Offset

(CONTINUED FROM PAGE 126)

ciable kingpin offset, this sidewise movement is materially augmented, making the train far more manageable. This is particularly noticeable in straight backing, in which case the centered kingpin makes exaggerated maneuvering of the tractor necessary to keep the trailer straight, whereas only a little is needed where adequate offset is employed.

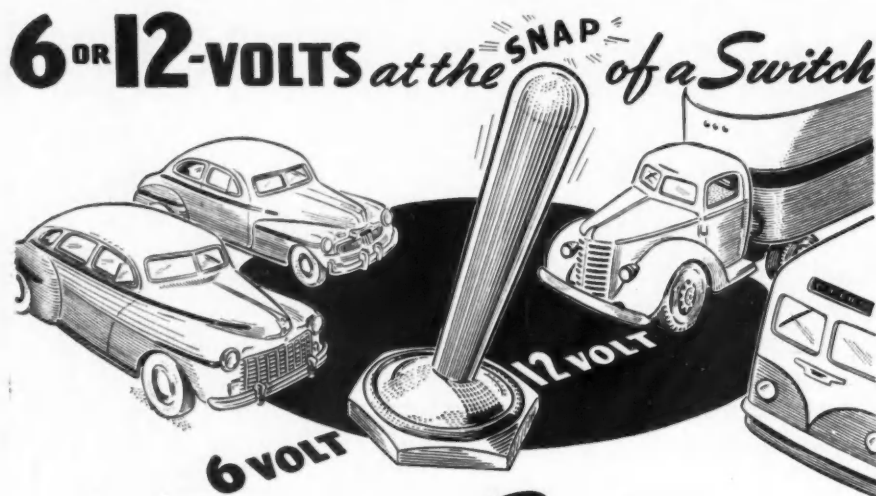
Riding

EASE of riding is far from ideal in any tractor-semi-trailer, so far as the driver is concerned. Regardless of the trailer, the tractor driver rides on a short wheelbase with rear springs which must be relatively stiff when running light. Kingpin offset distributes a part of the fifth wheel load to the front axle, thereby reducing the extremes of loading on the rear axle. This may exert a favorable influence. In addition, the location of the fifth wheel trunnion

ahead of the tractor rear axle may also decrease the reactions due to trailer drag or over-run. Where the trunnion is directly over the tractor axle, the tractor in effect becomes a bell-crank whose fixed pivot is the rear axle, so that all of the reaction from the horizontal thrusts is resolved into vertical action on the front springs. When it is advanced, then these reactions are shared between the two sets of tractor springs. This, also may affect riding.

Offset Limitations

PREVAILING practice seems to limit kingpin offset to between 4 and 6 in. ahead of the tractor axle and most standard trailer models seem to have been designed with weight distribution and throat clearances of approximately this amount. Tractors, too, and the standard SAE CA dimensions seem to have been set up in most instances with such a degree of offset in mind. These circumstances, in themselves, limit the amount of kingpin offset which is practical, regardless of theoretical considerations. But, as we have already seen, the clearance angle also limits how far we may go.



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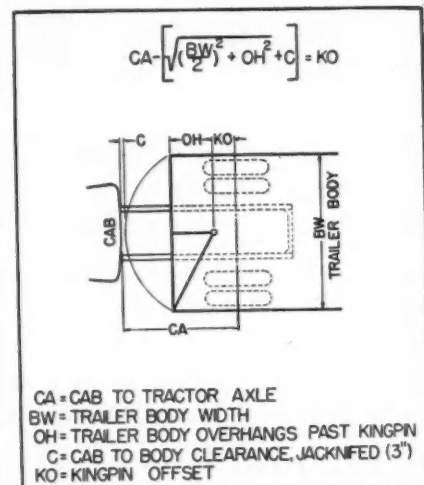


FIG. 5. Diagonal distance from kingpin center to corner of body is limiting dimension for cab clearance

One of the first dimensional limitations is the necessary cab clearance for jackknifing. The diagonal distance from the kingpin center to either corner of the body must not be greater than will allow adequate clearance to the cab when the trailer is jackknifed to the critical angle (Fig. 5). The formula for the solution of this maximum offset is given (TURN TO PAGE 130, PLEASE)



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New Aviation Quality Electric Speedometer

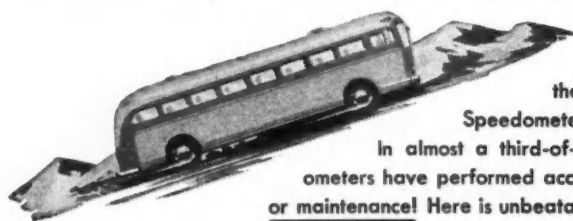
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Kingpin Offset

(CONTINUED FROM PAGE 128)

in the figure and in conventional tractors it works out at about 14 in. in most cases.

It has been thought by many that round or oval-front trailers offered the possibility of greater kingpin offset for the same CA dimension but since the controlling dimension is the diagonal from the kingpin to the front corner of the body, it is the width of the body, rather than its shape which limits how far forward the kingpin may go while providing proper jackknifed clearance.

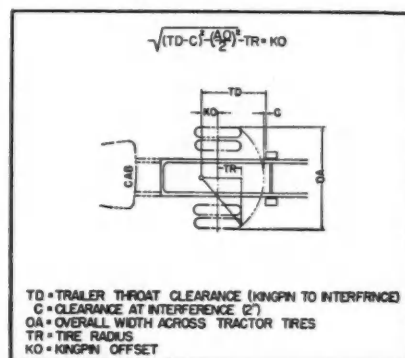


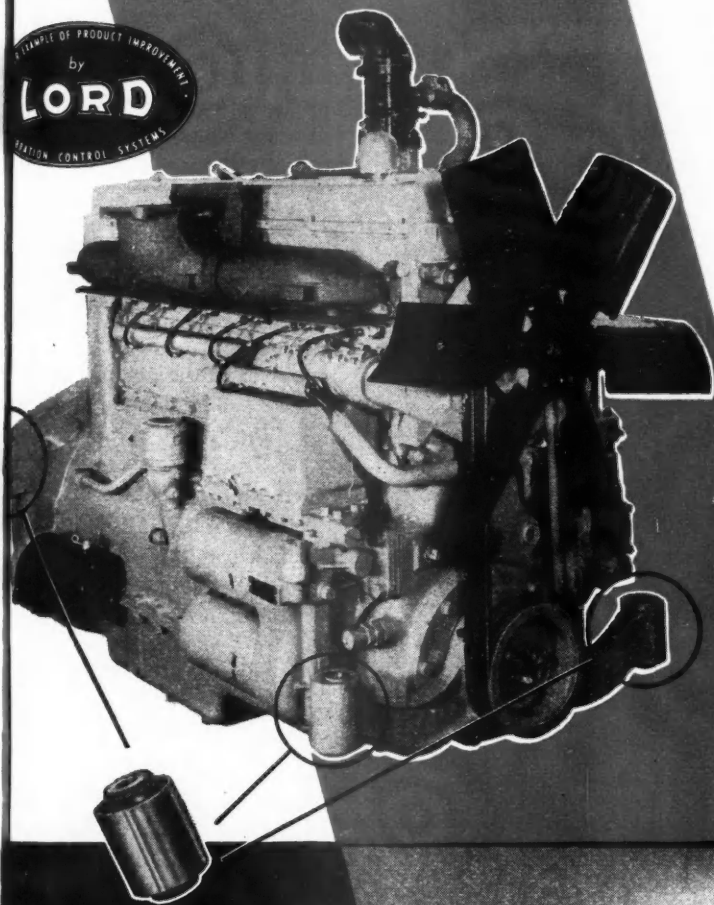
FIG. 6. Diagonal distance from kingpin to rearmost outer point of tractor tires is limiting dimension for determining trailer underbody clearance

Another limitation is that of trailer throat clearance. Not only must the trailer body clear the tractor cab, but the tractor tires must not interfere with the under parts of the trailer when jackknifed. Usually the support wheels are the parts most likely to interfere. As shown in Fig. 6, it is the diagonal distance from the kingpin center to the rearmost outer point on the outside tires which is the limiting dimension and may readily be solved in terms of maximum kingpin offset by the formula given in the figure. This is subject to great variations as between different trailers, but in almost all cases the trailer can be adapted to accept the maximum offset permitted for proper cab clearance and clearance angle.

It has been suggested that greater kingpin offset might be provided within these limitations by reducing the overhang of the front of the trailer beyond the kingpin. This, un-

(TURN TO PAGE 132, PLEASE)

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The Hall-Scott Model "400" Engine and one of the four Lord Tube Form Mountings which support it.

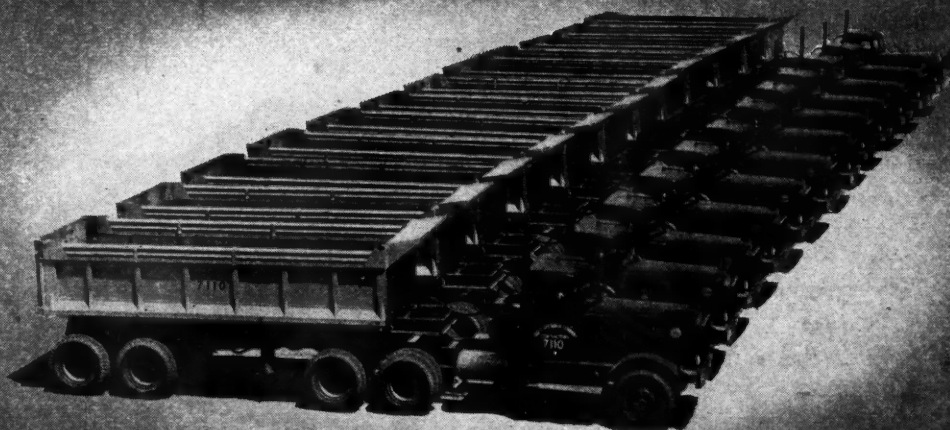
Twelve Peterbilt trucks powered by Hall-Scott "400" Engines, used by Guy F. Atkinson in the gigantic earth-moving job at Mills Field, San Francisco. Lord Mountings isolate engine vibration, absorb road shocks and frame twist, reduce breakdowns and improve performance.

HALL-SCOTT Powered— PETERBILT TRUCKS Use LORD SHEAR TYPE ENGINE MOUNTINGS

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Kingpin Offset

(CONTINUED FROM PAGE 130)

fortunately, will affect the cab clearance only, for the trailer throat clearance and the clearance angle will remain limiting factors, regardless of the trailer overhang. Moreover, thus moving the kingpin forward on the trailer frame will disturb the load distribution between the kingpin and the trailer axle, in compensation for which it will be

necessary to move the trailer axle further back. This will increase the effective wheelbase of the trailer and thereby aggravate off-tracking. In addition it will increase the bending moment on the frame of the trailer, necessitating somewhat heavier construction.

Coupling Height

SO FAR, only the horizontal location of the kingpin with reference to the tractor rear axle center has

been considered; but as location always involves three dimensions, we must also consider transverse and vertical location. The first, of course, presents no problem, since in all cases it will be located on the longitudinal centerline of both the tractor and the trailer. The latter, however, is of considerable significance. From the standpoint of trailer stability, the ideal vertical location of the fifth wheel plate would be as high as possible. Exactly the opposite is true with respect to tractor stability. However, since the tractor is by its inherently lower center of gravity and its four-point support the more stable of the two, it is apparent that overall stability of the train calls for as high a fifth wheel as other considerations will permit.

These other considerations include the effect upon trailer floor height and consequent center of gravity height, effect upon clearance angle and effect of weight transfer on gradients and under acceleration and deceleration. Still another effect to be considered is the maintenance of proper clearance for the tractor tires when negotiating uneven surfaces.

Although drop-frame trailers are used to a considerable extent, the majority have flat floors for more convenient stowage and movement of load and for proper distribution of load toward the front of the body. Floor heights of trailers should be kept as low as practicable both for the sake of keeping the center of gravity down for safety and avoiding excessive load platform height. This definitely limits the height of the fifth wheel plate. Usually the upper plate is placed directly across the bottom of the frame, although

(TURN TO PAGE 134, PLEASE)

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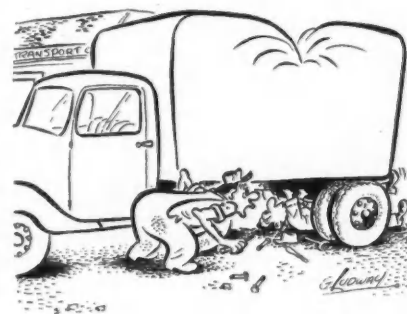
- he gets on his desk every morning a little chart that shows all the truck did yesterday.
- he then knows how often the truck stood idle, and exactly how long—all day.
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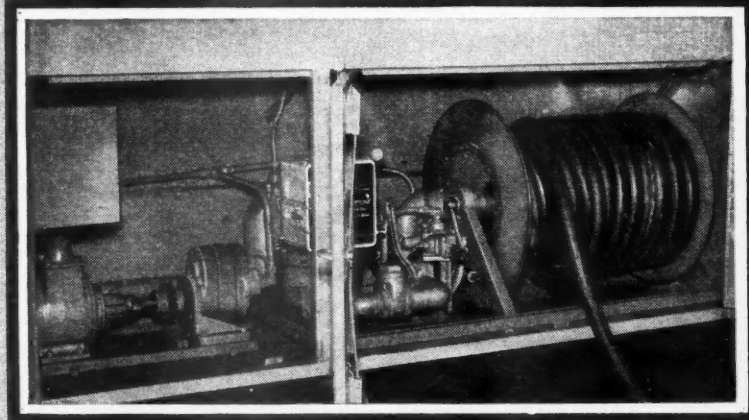
When the driver of this truck is ready to make a delivery, he simply pushes the hydraulic control lever back. This starts the product pump and frees the hose reel. A valve in hose nozzle prevents product flow until hose connection is made—the product pump discharging through a bypass valve. When nozzle valve is opened, the bypass automatically closes and product flows. Driver does not have to walk back to the truck. On completion of delivery, he closes nozzle valve, returns to truck and pulls control lever forward. That stops the product pump and engages the hydraulic drive to the hose reel, winding in the hose.

This Vickers Hydraulics application is engineered to deliver product in the shortest time with the least amount of effort for the driver.

Consider the advantages of Vickers Hydraulics for your drive problems, which may provide a better solution at lower cost and with less maintenance.

E242

(Below) Vickers Hydraulic.
Motor drives product pump
at extreme left. Hydraulic con-
trol valve is next to reel.



VICKERS Incorporated

DIVISION OF THE SPERRY CORPORATION

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TULSA • WASHINGTON • WORCESTER

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

Kingpin Offset

(CONTINUED FROM PAGE 132)

some height might be gained for recessing it slightly.

In an attempt to standardize trailer coupling heights for the sake of promoting sideways stability interchangeability of tractors and trailers and uniform load platform heights, a Subcommittee on Motor Vehicle Design of the Transportation & Maintenance Activity of the SAE

rendered a report which was published in the *SAE Journal* of April, 1937, setting the uncoupled height of the fifth wheel plate at tire height, plus coupled clearance of 2½ in. plus tractor spring deflection of 4 in. or 6½ in. above the tire height.

Fig. 7 illustrates the basis for this recommendation. However, it has been pointed out that this analysis of the problem does not take into consideration the transverse angular displacement of the tractor rear axle with respect to the tractor frame

when negotiating uneven surfaces, approaches the problem in profile alone.

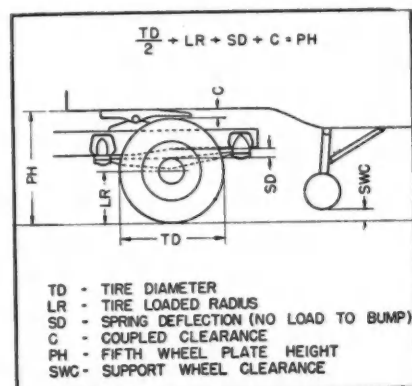


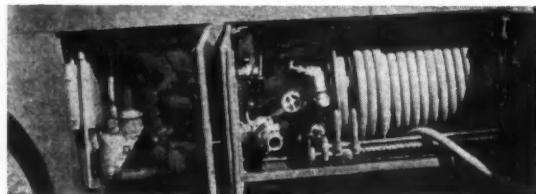
FIG. 7. Cut and formula show bases for recommendation of standard coupling height of 6½ in. above tire height



SAFE DELIVERY OF FUEL OIL

While the transportation of stove and furnace oils does not present hazards comparable to the delivery of gasoline, the Sinclair equipment pictured above indicates the great precautions which most major marketers take in assuring safe delivery of their products. This delivery truck is equipped with S. & J. Internal Hydraulic Valves. Normally in a closed position, they are held open by hydraulic pressure against spring tension. They close instantly when the hydraulic pressure is released.

Should a fire occur while unloading, small fusible plugs installed in the hydraulic line will melt and release the hydraulic pressure when subjected to even as much heat as produced by an ordinary match. This is typical of the Sinclair conception of delivering petroleum products in residential areas—MAXIMUM SAFETY ALWAYS.



SHAND & JURS CO.

BERKELEY, CALIFORNIA

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HOUSTON

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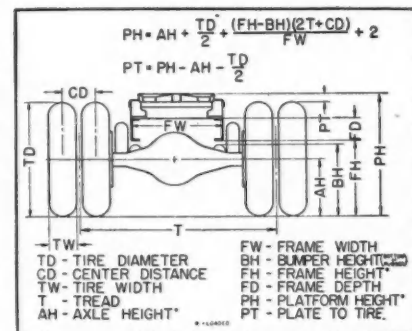


FIG. 8. Additional data for considering transverse angular displacement of tractor rear axle on uneven ground as it affects the coupling height

Accordingly, as shown in Fig. 8, an analysis has been made from this standpoint. It is apparent that the plate heights required for complete avoidance of interference between the tractor tires and the underside of the trailer may be considerably above those. On the other hand, practice seems to follow the principles enunciated in Fig. 7. In practice, interference between the tractor tires and the underside of the trailer does sometimes occur. The question therefore resolves itself into whether the advantage of the lower trailer floor heights resulting warrant the risk.

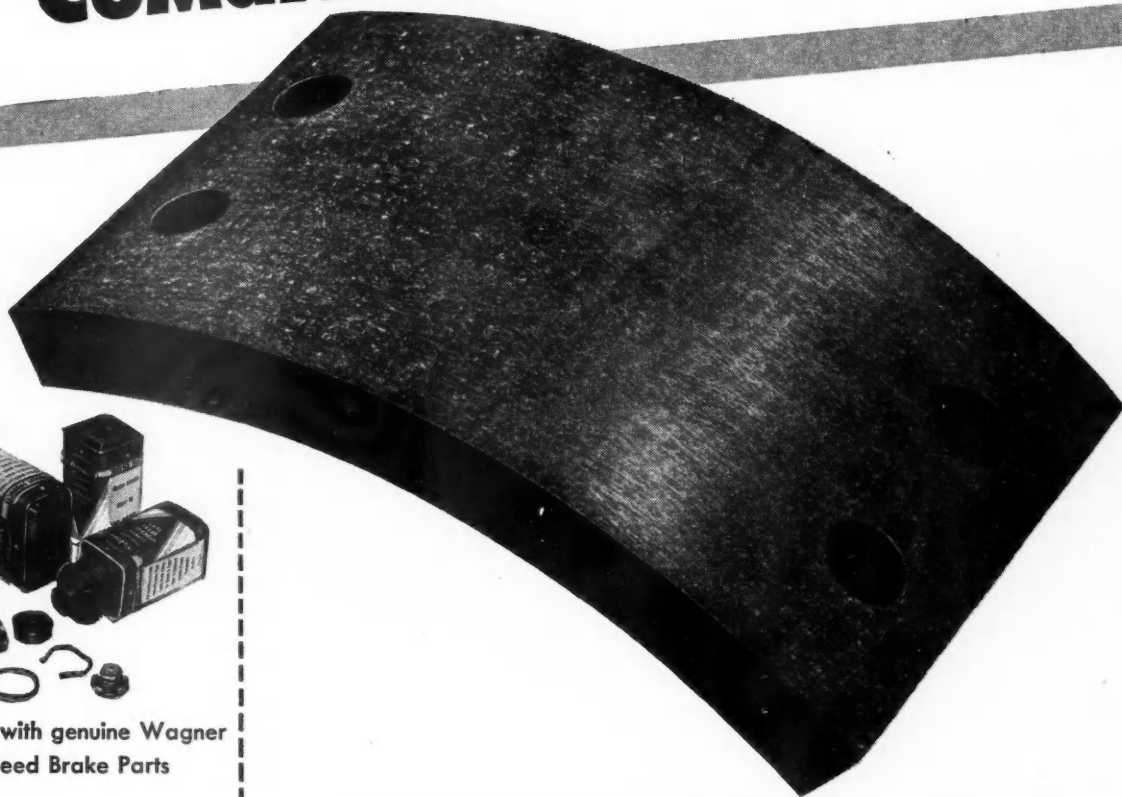
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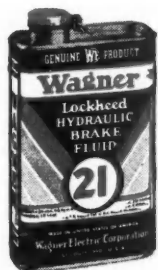




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Hydraulic Brake Fluid



Turn out better brake jobs . . . help reduce automobile accidents. CoMaX lining is unsurpassed for quick, safe, smooth stops. It has exceptionally long-wearing qualities and is uniform in texture, noncompressible, ageproof and easy on the drums.

You can buy with confidence when you specify CoMaX. Available in sets, rolls, blocks, slabs or cut segments. Like Wagner Lockheed Hydraulic Brake Parts and Fluid, it is warehoused throughout the U. S. and Canada, and is available everywhere through Wagner jobbers.

Wagner Electric Corporation

6470 Plymouth Ave., St. Louis 14, Mo.

EVERY REPAIRMAN NEEDS

Bulletins HU-17G and HU-197 . . . Tips for better Brake Service—free on request

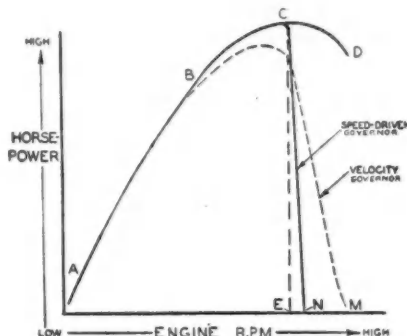
LOCKHEED HYDRAULIC BRAKE PARTS and FLUID • **MoVal**
CoMaX BRAKE LINING • AIR BRAKES • TACHOGRAPHS
ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES

B48-2

Engine Governors

(CONTINUED FROM PAGE 41)

Fig. 1 is a chart showing the general requirements of all governors for automotive engines. Referring to Fig. 1, the curve A-B-C-D represents the maximum horsepower available at wide-open-throttle at different engine speeds. Thus at each engine rpm, the curve shows the maximum power that the engine will deliver. The horsepower is shown on the vertical scale and the engine rpm



is shown on the horizontal scale. The curve shows that the available horsepower increases as the engine rpm increases, but after the "peak" horsepower at C the available horsepower reduces (from C to D) as the engine rpm is increased further.

The vertical dotted line C-E represents optimum governor performance. This curve shows the variation in rpm as the load is varied from full-load at C to no-load at E. Since the line C-E is vertical, the rpm at full-load at C would be the same as at no-load at E; hence a truck equipped with a governor giving this performance could climb a hill with no loss in rpm. As the vehicle ascends the hill, the governor throttle would gradually open to maintain the constant rpm along the line E-C while the power (and load) increases from low-load at E to full-load at C. If the hill gets steeper, the engine rpm will reduce along the line C-B because the engine cannot deliver any power above this line which would be necessary to maintain the governed rpm.

One of the two basic types of governors which is used extensively is the velocity-vacuum governor. This type of governor utilizes the forces accompanying the flow of air to the engine. Briefly, the governor throttle is offset so that the impact force of the air-flow tends to close the governor throttle against a calibrated spring. Thus when the engine speed tends to increase, the increased air flow tends to close the governor throttle against the force of the spring to maintain the governed speed.

Because velocity governors do not require a separate engine drive, they have the inherent advantage of low cost and simplicity of installation. However, because of the lack of an engine speed drive, they cannot hold the engine rpm as closely as speed-driven governors, which is the second type of governors now in use. A speed-driven governor is one that incorporates an engine-driven element as the controlling factor, so that the control is manifested in response to changes in engine rpm.

Presently, there are several kinds of speed-controlled governors and all give comparable performance. One of these is the well known fly-ball governor which utilizes centrifugally operated weights to move the governor throttle against a spring by means of suitable linkages. An excellent hydraulic governor has been developed in which a pump and a centrifugally operated bleed-valve control the pressure of oil that motivates a piston which in turn moves the governor throttle against a spring. In another type of speed controlled governor a diaphragm is used to

(TURN TO PAGE 138, PLEASE)

NEW! SOUTH BEND 14" Drill Press

South Bend presents this new 14" Drill Press as a companion to the South Bend Precision Lathe. It is built with the same high standards of accuracy and skilled workmanship. Years of painstaking research and experimentation have gone into its designing. This has resulted in a superior tool that is unsurpassed for accuracy, ease of operation, versatility and dependable performance.

\$98.00 f.o.b. factory, bench model with chuck, extension cord and switch; less motor.

FEATURES and SPECIFICATIONS

BELT TENSION RELEASE. Quick-acting belt tension release lever simplifies speed changes. Keeps tension correct.

BUILT-IN LIGHT. Provides shielded illumination for work area. Separate on-off switch.

SPINDLE. Free-floating design prevents misalignment, side thrust and whip. Travel of spindle 4"

BALL BEARINGS. Sealed type. No oiling. 2 on spindle drive unit, 2 on spindle.

QUILL BEARING ADJUSTMENT. Compensates for wear.

DEPTH GAUGE. Graduated in inches. Adjustable collars control feed and return.

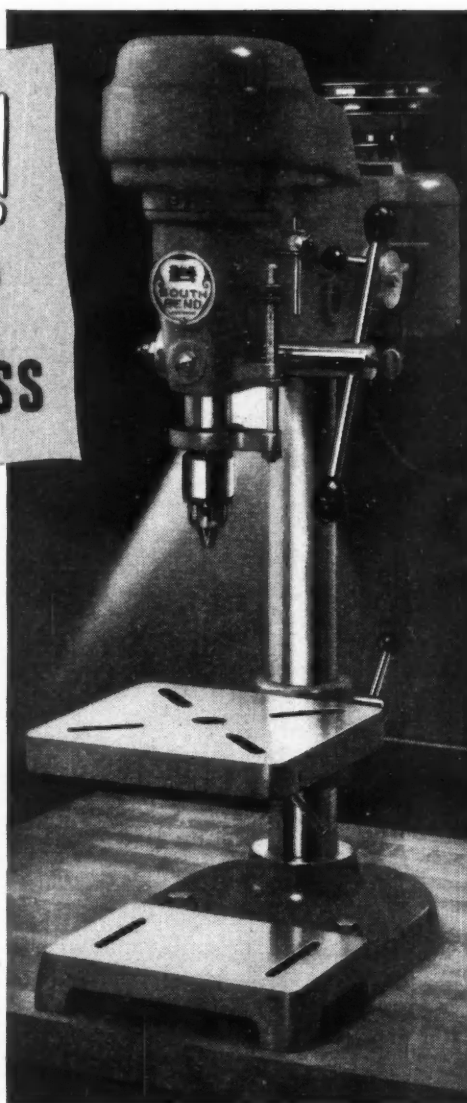
RUGGEDLY CONSTRUCTED. Precision-built for industrial and all other types of shops.

TWO MODELS. Bench or floor type.

CAPACITY. Maximum drill size in iron or steel, 1/2". Drills to center of 14" circle.

CHUCK. Capacity 0 to 1/2"

SPEEDS. Four 707, 1305, 2345, 4322 r.p.m.



CHUCK TO BASE DISTANCE. Bench Model 17" Floor Model 46 1/4"

TABLE SIZE. Tilt Type 10" x 10"

COLUMN. 2 3/4" diameter. Accurately ground.

HEIGHT. Bench Model, 35 1/2" . . . Floor Model, 65 1/4"

SHIPPING WEIGHT. Bench Model 195 lbs.

Floor Model 235 lbs.

MOTOR REQUIRED. 1/2 h.p., 1725 r.p.m. Vertical mounting. On-off switch provided.

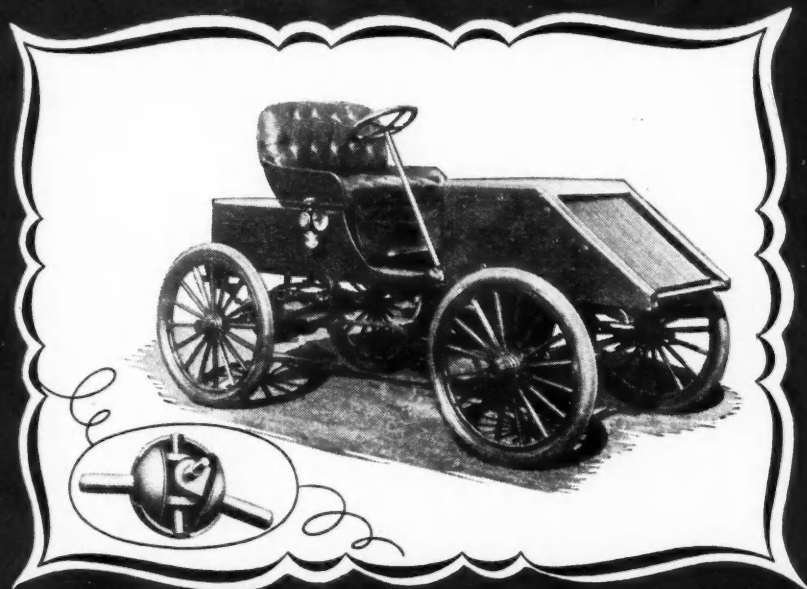


SOUTH BEND LATHE WORKS

BUILDING BETTER LATHES SINCE 1906 • 445 E. MADISON ST., SOUTH BEND 22, IND.

Spicer

The pictures at the right illustrate the first Spicer Universal Joint and the Spicer automobile in which its efficiency was proved.



The Pioneer LEADS THE WORLD in Automotive Universal Joint and Propeller Shaft production!

The great preference for Spicer Universal Joints and Propeller Shafts is the result of many exclusive advantages, both in manufacturing experience and design.

Spicer revolutionized automotive power transmission in 1904 with the invention of the first practical universal joint.

Spicer developed the telescoping action so necessary in propeller shaft action.

Spicer developed the flange yoke and companion flange idea.

Spicer developed the outer casing of universal joints for better lubrication and protection.

Spicer introduced spring retainers that automatically compensate for packing wear.

Spicer pioneered the tubular shaft which enabled large diameters to be used with light weight.

Spicer developed the I-G type joint to seal in lubricant.

Spicer perfected cageless roller bearings, giving the Spicer Universal Joint far greater load capacity at higher speeds with less friction than any other type of similar product.

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PASSENGER CAR AXLES • CLUTCHES • PARISH FRAMES • STAMPINGS • UNIVERSAL JOINTS
SPICER "BROWN LIPE" GEAR BOXES • RAILWAY GENERATOR DRIVES

Engine Governors

(CONTINUED FROM PAGE 136)

power the governor throttle, and a portion of the manifold vacuum is used as a source of power for the diaphragm; a centrifugally controlled air valve determines when the suction can operate the throttle, so that in this governor, also, the control is based on the speed of the engine.

Referring again to Fig. 1, the line N-C represents the typical performance

of any of the speed-controlled governors. With this type of governor the governed speed at no-load at N is about 150-200 rpm higher than at full-load at C. With present governors, it is not desirable to operate along the line C-E in which there is no variation in rpm because the vehicle will lurch when the driver shifts into the lower gears. Observe that the line N-C is straight all the way up to the wide-open-throttle power curve at C. This means that a speed-controlled governor does not "choke-off" the power when pulling a heavy load up a hill.

Referring to Fig. 1, the line B-M represents the typical performance of a velocity governor. With these governors the engine rpm at no-load at M is about 300-500 higher than the full-load engine rpm. Also, because velocity governors depend on the air resistance to move the governor throttle there is a slight power loss at full-load; this effect is shown in Fig. 1 since the curve M-B does not increase to meet the wide-open-throttle curve at C as with speed controlled governors. This characteristic will be noted by the driver when pulling a heavy load over a hill since it will be necessary to go into lower gears sooner than with a truck equipped with a speed-driven governor. Thus, although a velocity governor has the advantage of lower initial cost and is easier to install than a speed-controlled governor, they tend to lose more rpm and power than speed-controlled governors when the vehicle is climbing a hill.

END

(Please resume your reading on P. 42)

Quiz Answers

CCJ Quiz on P. 71

1. Reo, which gets its name from the initials of Ransom E. Olds, has its plant at Lansing, Mich. Its advertisement has appeared on the front cover of the COMMERCIAL CAR JOURNAL for quite a few years.
2. Diamond T. The gem of course is a diamond, and the company was founded by Charles A. Tilt. (The "T" in Diamond T stands for Tilt.)
3. Ford.
4. Walter, builder of Snow Fighters, located at Queens, Long Island.
5. Studebaker, which was in existence before the Civil War, was once a leader in the manufacture of carriages and wagons.
6. White, which once built a steam car that was the chief rival of the Stanley Steamer.
7. Chevrolet. The Little Motor Car Co. of Flint, Mich., was the fore-runner of the Chevrolet.
8. FWD, or Four-Wheel-Drive.
9. Dodge, founded by John and Horace Dodge and now maker of "Job-Rated" trucks.
10. Mack, which uses a bulldog as a trade mark.

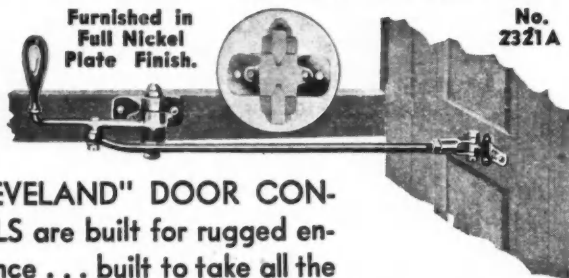
ARK. ADOPTS AASHO LIMITS

Arkansas adopted highway size and weight limits recommended by the American Association of State Highway Officials effective Feb. 1. These provide a single unit length of 40 ft, a tractor semi-trailer length of 50 ft, and other combination lengths of 60 ft. The weight limit remains at 18,000 lb per axle.

"Cleveland" Door Controls

Furnished in
Full Nickel
Plate Finish.

No.
2321A

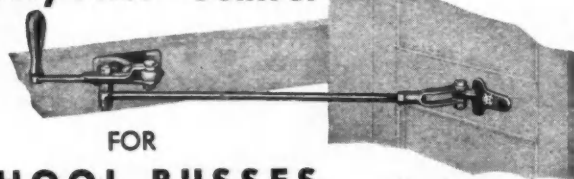


"CLEVELAND" DOOR CONTROLS are built for rugged endurance . . . built to take all the knocks and hard wear Commercial Busses are subjected to. Yet users marvel at their smooth, quiet operation.

CLEVELAND PIVOT BEARING CONTROL

The hub moves on two cone-shaped, self-lubricating pivot bearings of hardened steel. All bolts are fastened with castellated nuts and cotter pins to allow easy adjustment of wear. It locks the door both open and shut with absolutely no rattle.

"Safety First" Control



FOR
SCHOOL BUSES

No. 2322A

HERE'S A SPECIAL "CLEVELAND" DOOR CONTROL DESIGNED FOR SCHOOL BUSES. Already used on hundreds of busses from coast to coast because of its advantages over ordinary controls. It is DURABLE, DEPENDABLE, EASILY OPERATED and A BIG AID TO SAFETY. Cadmium plated finish.

SEND FOR CATALOG 22-B.

The Cleveland Hardware & Forging Co.

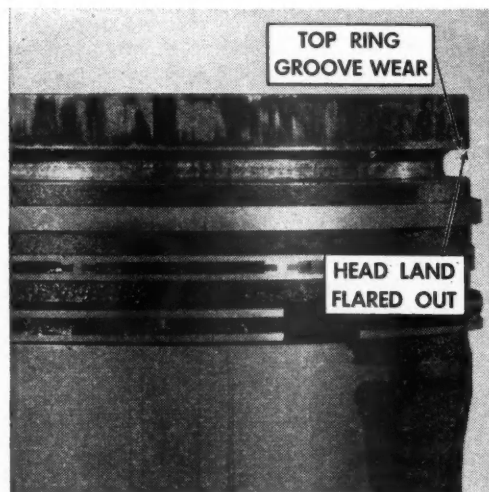
3264 East 79th St.

Established 1887

Cleveland 4, Ohio

SEALED POWER GI-60 Contracting Groove Insert

puts $\frac{1}{32}$ " of heat-resisting, wear-resisting
steel armor plate at top of top ring groove

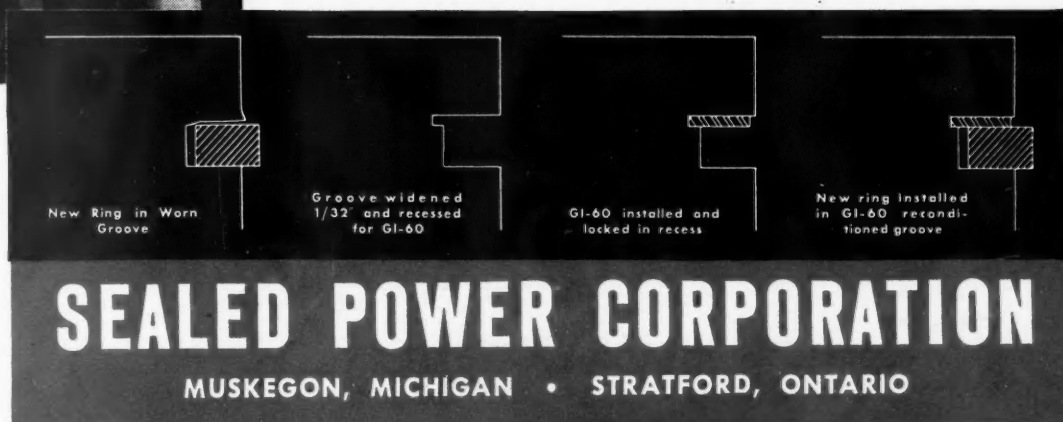


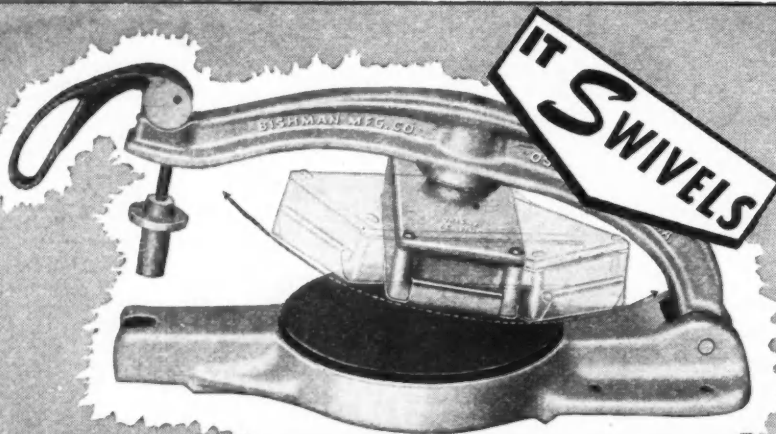
YOU can fix that worn top ring groove for keeps with the new GI-60 Contracting Groove Insert. It's not a spacer. It doesn't float. It is anchored securely at the top of the ring groove, which has been regrooved to an absolutely true surface $\frac{1}{32}$ wider than before, with a $\frac{1}{32}$ recess at the top. GI-60 locks itself permanently into this recess. It becomes a heat-treated shield of heat-treated spring steel. It resists wear and pounding better than aluminum, better than cast iron. *It is the only dependable, economical answer to top ring groove wear.*

New rings in old, worn top grooves are good money thrown away. They stick. They wear out fast. They cause cylinder wear. They waste gas. To widen the groove and use a wider ring changes the manufacturer's specifications—invites trouble. To use an ordinary spacer is simply to use a wider ring in two parts. *GI-60 is the only proved satisfactory answer.*

Your Sealed Power distributor can install GI-60 for you. He has the special tools required. GI-60 means profitable business for you and satisfaction for your customers. It is just as effective in new pistons as in old ones. Ask your Sealed Power Distributor or write direct.

MAKES OLD PISTONS NEW — KEEPS NEW PISTONS YOUNG





BISHMAN *Vulcanizer*

—for ALL tubes—BIG and Small

The latest, most practical achievement in highest quality heat element and control compactly enclosed in vulcanizing shoe. Assures correct, uniform, constant heat for strongest and most lasting repairs. Vulcanizing is done from the top down—the operator can see what he's doing—easy to place patch correctly. The lever lock is easily and quickly operated—provides the proper pressure on patch.

The Swiveling Shoe can be adjusted to any position—the tube lies in a normal flat position on the resilient thick rubber pad. It can vulcanize an injury of 8½ inches with each cure. Makes it easy to splice inner tubes.

Ideal for truck and tractor tubes. Has a 16 inch clearance—any size tube will fit in without folding or distorting. For vulcanizing all sizes of valve stems, 2 adapters are furnished.

No. 870—BISHMAN Heavy Duty Tube Vulcanizer. DEALER PRICE **\$34.50**

Ask your Jobber or write for folder

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**FOR THE BEST IN SAFETY
LIGHTING AND
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ALL THE
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**BUY
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Fleetman's Library

STONEHARD RESURFACER FOLDER, a two-color publication describing the heavy-duty material for repairs and overlays to concrete and wood floors. Illustrations show typical applications. Write the Stonehard Co., 403 N. Broad St., Philadelphia 8, Pa.

REPS PIPE AND STUD EXTRACTORS, four-page bulletin describing and illustrating master set No. 210 pipe and stud extractors. Photographs show how the device is used to ream and extract broken pipes and screws. Reps Tool Co., 94 Allyn St., Hartford, Conn.

MORE EFFICIENT SMALL TOOL GRINDING, a 4-page brochure showing how the grinder is used to sharpen tools and finish work. Available from Corlett-Turner Co., 1001 S. Kostner Ave., Chicago, Ill.

CABLE CATALOG, showing the Andrews line of automotive cable and electrical products. The Andrews Mfg. Co., St. Louis, Mo.

TITEFLEX CATALOG, a 10-page, illustrated publication showing Titeflex hose for automotive gas lines, oil lines, air lines and oil filter lines. Write Titeflex, Inc., 525 Frelinghuysen Ave., Newark, N. J.

GAS WELDING WIRE CATALOG, a 3-color 24-page brochure devoted to gas welding and its use. Covers the complete Page line, gives the application, procedure, proper torch adjustment, physical properties or each gas welding rod. Write Page Steel & Wire Division, American Chain & Cable Co., Inc., Monessen, Pa.

23 IDEAS, a folder showing use of Kleer Vu products throughout the industry. The publication suggests these plastic envelopes for holding forms, instruction cards, loose-leaf material, notes and similar data which should be protected from dirt, grease and wear. Write American Plastic Products Co., 2907 S. Main St., Los Angeles, Cal.

BARRETT BRAKE SCHOOL

Attention is directed to a statement in the article "Service Schools for Fleetmen" appearing in the January issue. We mentioned that the Barrett Brake School consisted of a 10-week course of instruction. Actually the course consists of 10 days instruction.

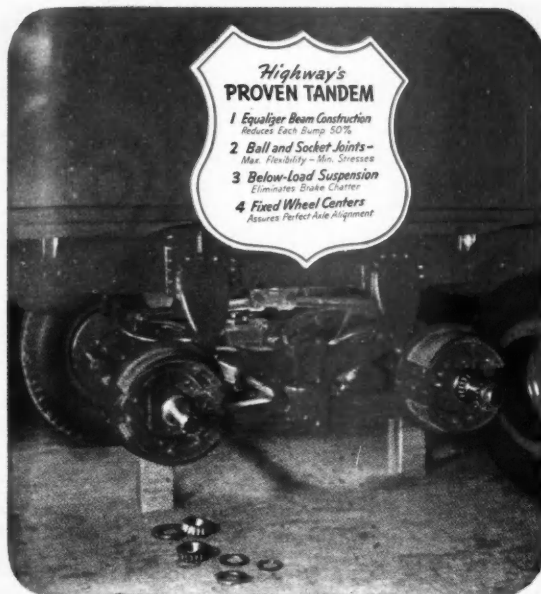
Cleaner's Dandy



Quaker Dry Cleaners of Pittsburgh rate an oscar for the handsome appearance of the newest addition to their Diamond T fleet, a model 509 SC

HIGHWAY'S 20,000 LB. RUNNING GEAR

1. One-piece forged axle
2. Twin bearings
3. 7" brakes — $\frac{3}{4}$ " lining
4. Variable rate spring suspension
5. Spring steel radius rods, adjustable
6. Cam shafts roller bearing mounted



HIGHWAY'S PROVEN TANDEM

1. Equalizer beam construction reduces each bump 50%
2. Ball & Socket Joints max. flexibility — min. stresses
3. Below-load suspension eliminates brake chatter
4. Fixed wheel centers assures perfect axle alignment



Whether it's single or tandem you need, Highway Trailer has the best answer!

HERE'S why it pays you to do business with today's Highway Trailer Organization: Highway is a manufacturer of trailers! Highway converts raw materials into the finest of castings—produces axles, brakes, supports and many other components *under one roof—with one overhead—with one profit!* Naturally you get more for your money!

Take axles as an example. Study Highway Trailer's new 20,000-lb. single axle. Consider Highway's thoroughly proved tandem. Both tops in the field!

Give your business the benefit of Highway's more than 30 years of

successful manufacturing experience—Highway's network of factory branches and distributors—and Highway's unexcelled manufacturing facilities! Write for all the facts about the new Highway Clippers and Freightmasters! It means money in your pocket—every year for many years!

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General Offices, Edgerton, Wisconsin

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Earth Boring Machines

Winches and other Public Utility Equipment



HIGHWAY AMERICA'S QUALITY TRAILERS

foul weather

...but

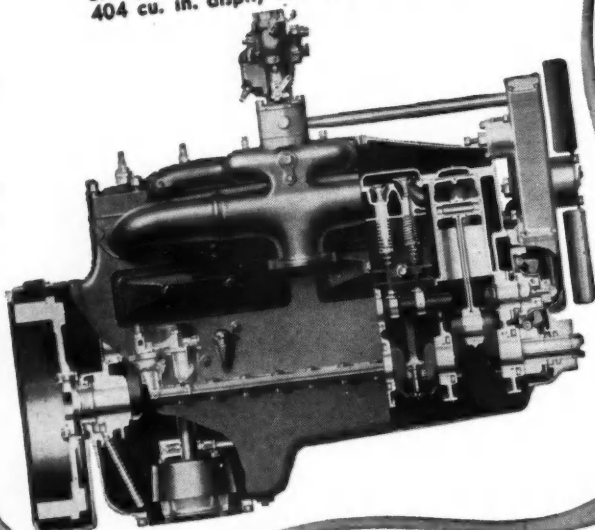
THE TRUCKS GO THROUGH



Bad weather didn't faze this MZA Waukesha Engine powered Ward LaFrance Hose Wagon's performance at a West Side Pier fire in New York City

WAUKESHA MODEL 6-MZA HIGH POWER ENGINE

Six cylinders, 4 1/4 in. bore x 4 3/4 in. stroke,
404 cu. in. displ., 125 hp. at 2600 rpm.



• Adverse weather conditions are no excuse. Whether it's a fire-fighting truck :: bus :: or cross country merchandise transport truck—it's carrying payload. And it is up to the engine to take it through.

The new Model 6-MZA Waukesha Engine can *and does* take it through!

Streamlined... compact... smooth. Designed for use with modern 70-75 octane gasoline. Packed with power! Built to develop *and deliver* high power and high speed!

Every feature of modern construction and design. Drop forged, heat treated 7-bearing crankshaft. Hardened alloy exhaust valve seats. Aluminum pistons. Controlled turbulence combustion chamber. High duty precision bearings. Built-in centrifugal governor and full pressure oiling system. Send for Bulletin 1126.

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN • NEW YORK • TULSA • LOS ANGELES

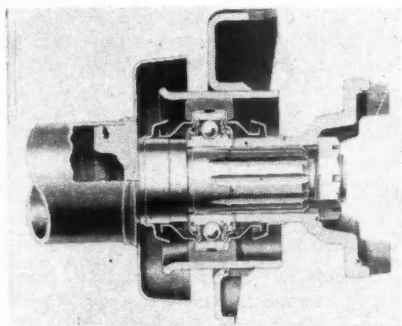
WAUKESHA ENGINES

Chevrolet for '48

(CONTINUED FROM PAGE 89)

A steering column gearshift is now available on models equipped with 3-speed transmissions. A new parking brake on these models is foot-operated. The foot pedal is securely locked in position by means of a self-energizing lock. A slight pull on the release handle is required to release the brake. Removal of the hand brake and gearshift levers from the floor area on $\frac{1}{2}$ and $\frac{3}{4}$ -ton models makes it easier for the driver to enter or leave through the right hand door.

Engine improvements include a heavier, more rigid crankshaft, new main and connecting rod bearings, modified bearing caps, an aluminum alloy camshaft gear and new Buna N valve stem oil seals.



The propeller shaft bearing support. Rubber-mounted bearing is a single row type permanently sealed and lubricated

New thin wall babbitt bearings are said to give more than double the life of previous bearings. Main bearings are interchangeable and are precision finished for ready installation. Front, front intermediate and rear intermediate main bearing caps are now more rigid, an improvement reducing bearing deflection and increasing bearing life.

Engine valve stems are now equipped with Buna N synthetic rubber seals, eliminating the necessity for valve spring cap covers. This is said to result in quieter valve operation.

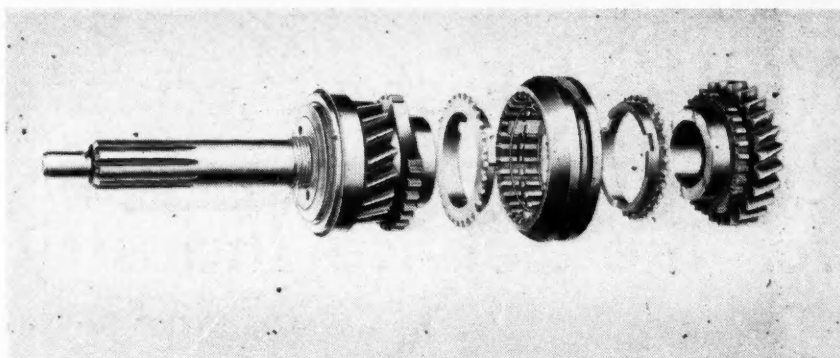
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(Please resume your reading on P. 90)

'47 HAD LOWEST DEATH RATE

The year 1947 ended with a traffic death toll estimated by the National Safety Council at 32,500. This is 1,200 less than the 33,700 killed in motor vehicle accidents in 1946 and 7,469 less than the 39,969 killed in 1941.

While travel figures are not yet available for the entire year, it has been estimated that mileage in 1947 ran about 10 per cent above 1946 and about 12 per cent above 1941. This would mean a 1947 fatality rate (deaths per 100 million vehicle miles) of between 8.5 and 9, the lowest in U. S. history.



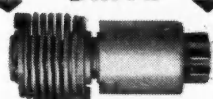
Exploded view of the new synchronizer for 3rd and 4th speeds. The new transmission has helical gears

The new one is worth
MONEY to you!

The old one is worth
MONEY to you!



**INSTALL
THIS
DRIVE**



**RETURN THE
OLD ONE IN
THIS BOX**



THEY'RE WORTH

MONEY!

When you replace with a genuine Bendix* Drive, you get a double return in money. Your customer pays you cash, of course, for the installation of the finest drive you can sell him. Furthermore, the old one is worth money to you when you return it to your Bendix Drive Central Distributor.

The old Bendix Drives are scrapped—That is your assurance that the Bendix Drive you sell is brand new and thoroughly efficient. Always replace with the genuine Bendix Drive.

*TRADE MARK

Genuine Parts
give Genuine Service

Bendix Drive

ECLIPSE MACHINE DIVISION of
ELMIRA, N. Y.



NOW: A Fast & Accurate Pin Fitting Machine for the Service Industry



TOBIN-ARP have developed a revolutionary new machine for fitting pins in connecting rods and pistons of all internal combustion engines. This machine fills a long felt need in the service industry.

It bores the wrist pin bushings and pin holes in the piston. Its novel means of holding the piston and rod is by air and hydraulic pressure. The piston or rod can be located in the machine in a few seconds and centered with an accurate expanding mandrel used on the inside of the bushing or piston holes—the clamping arrangement holds the rod or piston in the exact position it is centered.

The cutter revolves at a high speed and with the hydraulic feed produces a perfectly round hole, glass smooth. Cutter is set with the use of a comparator wherein the piston pin is used as a gauge. Comparator is graduated to .0001 so operator can select the proper clearance or press fit.

TOBIN-ARP MODEL P-M100 PISTON-PIN FITTING MACHINE

It eliminates any guess work and does a more accurate job faster than ever before possible. The operator knows definitely what clearance his connecting rod bushing has over the pin diameter, or if the pin is a pressed fit in the piston he knows exactly the press fit.

This machine has no gears, racks, screws, levers or handles—everything is operated by oil, air and electricity, making it a very fast machine. A set of six new over-sized pins can be fitted to six old pistons and six old rods in from 18 to 20 minutes.

Send for Complete Particulars

TOBIN-ARP MANUFACTURING CO.

2845 Harriet Ave. So.

Minneapolis 8, Minn.

Detroit Dispatch

(CONTINUED FROM PAGE 72)

Ford Six Rumor

We have a report—and we can give it no greater credence than that—that Ford will enlarge the bore of its six cylinder truck engine to 3½ in. (present bore is 3.3 in.), giving it about 100 hp. and greater torque, particularly at low speeds. It probably won't be announced till some time in mid-summer.

Chevrolet P-D Model

Chevrolet will have something new to offer in the way of a package delivery model in the near future. No details are available as yet, however.

Jiggleless Instruments

AC Spark Plug Division of General Motors has come up with a solution for taking the jiggle out of needles in dashboard instruments. A colorless silicone solution which AC used in making gunsights for the Army Air Forces during the war acts as a lubricant and prevents sudden movement of the needle without affecting its accuracy.

Canadian Agreement

Through an agreement with the Canadian government, truck shipments from the United States through Canada in bond to points in the eastern U. S. are being resumed. The arrangement had been in effect during wartime and had been terminated at the end of 1945. The new agreement came about as a result of the Geneva Trade Agreement and will reduce the distance trucks must travel to eastern points by about 110 miles.

Cross License Plan

Most truck and automobile manufacturers will continue to exchange patents under the extension of the industry cross licensing plan for another year. AMA reports that 17 motor vehicle builders are in the new agreement which covers patents owned on Jan. 1, 1940, with certain exceptions. All signatories are able to use patented inventions included in the plan without compensation or fear of infringement suits.

END

(Please resume your reading on p. 74)

WARD LAFRANCE CORP.

The new Ward LaFrance Truck Corp., Elmira, N. Y., has acquired all the business and assets of the former Ward LaFrance Truck Division of Great American Industries, Inc., New York. The new corporation is controlled by Joseph G. Grossman, president, and will be operated by him and A. Ward LaFrance, vice-president, both of whom have been identified with Ward LaFrance equipment for the past 30 years. They will continue the production of heavy-duty trucks, fire engines, and trolley coaches. All communications should now be addressed to Ward LaFrance Truck Corp., Elmira, New York.

Here it is!



a new Ferret Set by **Snap-on**

A new design... strong... adaptable...
they squeeze into close places easily

(All units $\frac{3}{8}$ " Square Drive)
 $\frac{1}{4}$ " and $\frac{5}{16}$ " Single Broached Sockets
 11—Double Broached Sockets
 from $\frac{3}{8}$ " to $\frac{7}{8}$ "
 1—Speeder Wrench
 1—8" Ratchet
 1—Sliding Tee
 1—Nut Spinner
 1—Universal Joint
 3", 6", and 12" Extensions
 —Complete in a metal box,
 $19\frac{1}{2}$ " x $5\frac{3}{4}$ " x $1\frac{1}{8}$ " — specially
 designed for this set.
 Rich red enamel finish.



Yes, a new Ferret set . . . new in design . . . way over
 par in performance — and they're twice as strong as
 you would expect such slim, slender handles and thin-
 walled sockets to be.

They squeeze into tight places and get those hard-
 to-reach nuts and bolts that defy the ordinary type
 wrench. Newly designed by Snap-on engineers, they
 make quick easy work of many of the tough jobs on
 modern motors and engines.

Be sure to ask your "Snap-on" man to show
 this set the next time he calls.

SNAP-ON TOOLS CORPORATION

8026-B 28th Avenue • Kenosha, Wisconsin
 INTERNATIONAL DIVISION: KENOSHA, WISCONSIN, U. S. A.

Washington Runaround

(CONTINUED FROM PAGE 74)

Due to the unanimous approval given the bill by the House Interstate and Foreign Commerce Committee, the ICC, and organizations of shippers and carriers, early approval by the Senate is anticipated.

As to other legislative matters, The Reed-Bulwinkle bill will probably be approved during the current session despite substantial opposition in some quarters. It will be remembered that this legislation authorizes carriers to enter into joint

rate-making agreements without fear of anti-trust prosecution, provided they comply with ICC regulations governing such agreements. However, a presidential veto of such legislation is a definite possibility.

Federal Highway Roundup

Highway development appears to be one of the few topics that may remain relatively free of politics during this election year. While this may not be true when details of highway programs are discussed, there seems to be general agreement between the Administration and Congress on the need for a strong construction program and continued Federal aid.

The President in various messages submitted to Congress last month repeatedly emphasized Administration support for highway measures. For example, in his Economic Report, he declared that "at least 45 per cent of our highways leading into cities need to be rebuilt within 10 years."

On Capitol Hill, Republican bills have been introduced to extend the Federal-aid highway program beyond the end of the fiscal year 1949.

Meanwhile, the Public Roads Administration, in a year-end report, announced that improvement of the nation's highways proceeded at a faster pace in 1947 than in the previous year.

Reviewing the progress of the highway program, Public Roads Commissioner Thomas H. MacDonald said contract awards authorized by the states during the year called for \$895,000,000 worth of work on 44,700 miles of road. This was approximately \$150,000,000 more than the cost of road construction contracted for in 1946.

The 1947 total included contracts for Federal-aid projects to cost \$640,000,000 and 19,800 miles in length.

Expenditures for State-administered highway work under way during the year amounted to approximately \$890,000,000.

At the year's end, Commissioner MacDonald said, Federal-aid projects costing more than \$700,000,000 were under construction, and plans had been approved for additional projects costing around \$350,000,000, on which work is expected to start this year. The total estimated cost of Federal-aid projects programmed by the States for construction but not yet advanced beyond the planning stage was nearing \$750,000,000.

The urgent need for better highways throughout the nation was emphasized by steadily mounting floods of traffic on main rural roads and urban thoroughfares, PRA stated.

For example, truck-hauling on rural roads during the past year was estimated at 86 billion ton-miles, as compared with a total of 73.5 billion ton-miles in 1946.

Commendable progress was made by the States, in cooperation with municipal authorities, in the planning and actual start of construction on expressways designed to speed the flow of traffic in urban areas and at the same time reduce accident hazards, Commissioner MacDonald added.

Work was begun during the year on urban expressways and multi-lane rural highways in Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, the District of Columbia, Florida, Ohio, Texas and California.

Commenting on contract price trends, Commissioner MacDonald noted that construction costs for various classes of road work have risen 180 to 193 per cent above 1940 costs.

Radio Allocations Delayed

The proposed decision of the Federal Communication Commission on permanent allocation of radio frequencies to highway users, including the trucking industry, is (TURN TO PAGE 148, PLEASE)



KEEP OUT
of the
danger zone—
KEEP ALL
of your
engine power

PIERCE
road-speed GOVERNING

● The Pierce Road-Speed Governor limits only one performance feature of your car or truck—high gear top-speed—if miles-per-hour restriction is your purpose.*

The Pierce Road-Speed Governor is centrifugal (flyball)—driven from the propeller shaft of the car—thus controlling positively only in relation to the speed at which the wheels are turning—regardless of gear, road conditions or load. It fits any standard automotive engine.

Set it at any speed you wish. Your vehicle has every ounce of power built into it to reach and maintain governed speed in any gear. Write for full particulars.

*The same type of governor, driven from the distributor, will give complete engine RPM protection without reduction of engine power or vehicle performance in any gear. In this manner of installation, the unit is positive engine protection only—not a miles-per-hour governor.

THE PIERCE GOVERNOR COMPANY, INC.

1611 OHIO AVENUE

ANDERSON, INDIANA



It takes **QUALITY PERFORMANCE** to get
an **ENCORE . . .**



and **YORK-HOOVER BODIES**
get "encore orders" time after time

The fact that fleet operators everywhere keep re-ordering York-Hoover Bodies is proof of their confidence in and approval of the York-Hoover product. Specific purpose design for low "per package" delivery cost, experienced and skilled engineering for dependability, and honest workmanship for economical maintenance and low depreciation—all contribute to this customer confidence and approval.

To meet this healthy, steadily growing demand, York-Hoover has increased plant and production facilities so that we hope to say "prompt deliveries" in the not-too-distant future.



YORK,

YORK-HOOVER
BODY DIVISION
CORPORATION



PENNSYLVANIA

Washington Runaround

(CONTINUED FROM PAGE 146)

not likely to be issued for at least another month. In fact, as this issue went to press, the Commission was still receiving briefs from interested parties. FCC officials told COMMERCIAL CAR JOURNAL that it is barely possible that the proposed decision will be handed down during the next 30 days, but that it is impossible to predict an accurate date due to the heavy work load now facing the agency.

Even after the proposed decision sets forth the frequencies to be used by high-

way users operating radiotelephone units the Commission will still have considerable work ahead. The reason for this being the fact that interested parties are given another opportunity to comment on the proposed decision before the Commission prepares its final report.

52 Transport Reserve Units

In a year-end progress report, the Transportation Corps states that 52 reserve units have been furnished by the trucking industry as part of the TC's Highway division reserve establishment.

These units scattered through 26 states and the District of Columbia include: 13 Highway Transport Divisions; 12 Trans-

portation Truck Battalions (Heavy); 24 Transportation Truck Companies (Heavy); and 3 Transportation Truck Companies (Petroleum).

Emphasizing the part played by state associations, the report states that the leading association in the total number of units affiliated is the Motor Truck Association of Southern California with a total of nine units affiliated in the Los Angeles area. The Ohio Association of Commercial Haulers is next with four units in Columbus.

"In the near future," the report continues, "a program for the commissioning of officers directly from industry will be put into effect. It is hoped through this program to encourage the experienced operators, maintenance personnel, driver instructors, terminal managers, and other qualified personnel to accepted commissions within these affiliated organizations. A recent Department of the Army circular has authorized certain Transportation Corps officers to serve over-age in grade. This will allow certain trucking industry personnel who would otherwise be disqualified to take an active interest and to participate in the organization of these highway units."

The Transportation Corps admits, however, "that the program has a long way to go with several hundred additional units varying from skeleton organizations of a few officers up to and including units of officers and enlisted men at full strength."

Transportation Corps officers hope that in the near future they will be able to visit states not already contacted and bring additional units into the program.

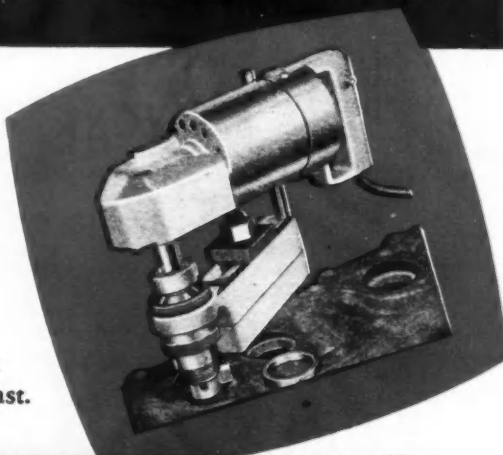
Interested associations or truck companies who desire to participate on the program are urged to contact Ray G. Atherton of the American Trucking Association, or Colonel Ross B. Warren, Chief, Highway Transport Service, Office Chief of Transportation, Washington 25, D. C.

END

(Please resume your reading on P. 77)

NEW POWER DRIVE SPEEDS CUTTING VALVE SEAT RECESS!

The new "Knock-Out" ¼ h.p. portable electric driver takes the labor out of cutting valve seat recesses. Just hold on top of tool—no pressure required—and feed cutter down to set depth. It's that simple and almost that fast.



FITS ALL "KNOCK-OUT" RESEATER SETS



Can be used with the "Knock-Out" Reseater Set you now have! Or if you have some old style reseater tool you'll want to replace it with a modern power driven "K-O" Reseater Set. Three set sizes—one to fit any requirement.

ASK YOUR JOBBER or Mail the Coupon TODAY!

K.O. LEE COMPANY

ABERDEEN, SO. DAK.

K. O. LEE Company
1103 FIRST AVE. S. E., ABERDEEN, SOUTH DAKOTA
Please send illustrated bulletin describing in detail the "K-O" R-5 Power Drive and Reseater Sets.

Name.....
Address.....
City.....State.....

NEW SYNTHETIC RUBBER

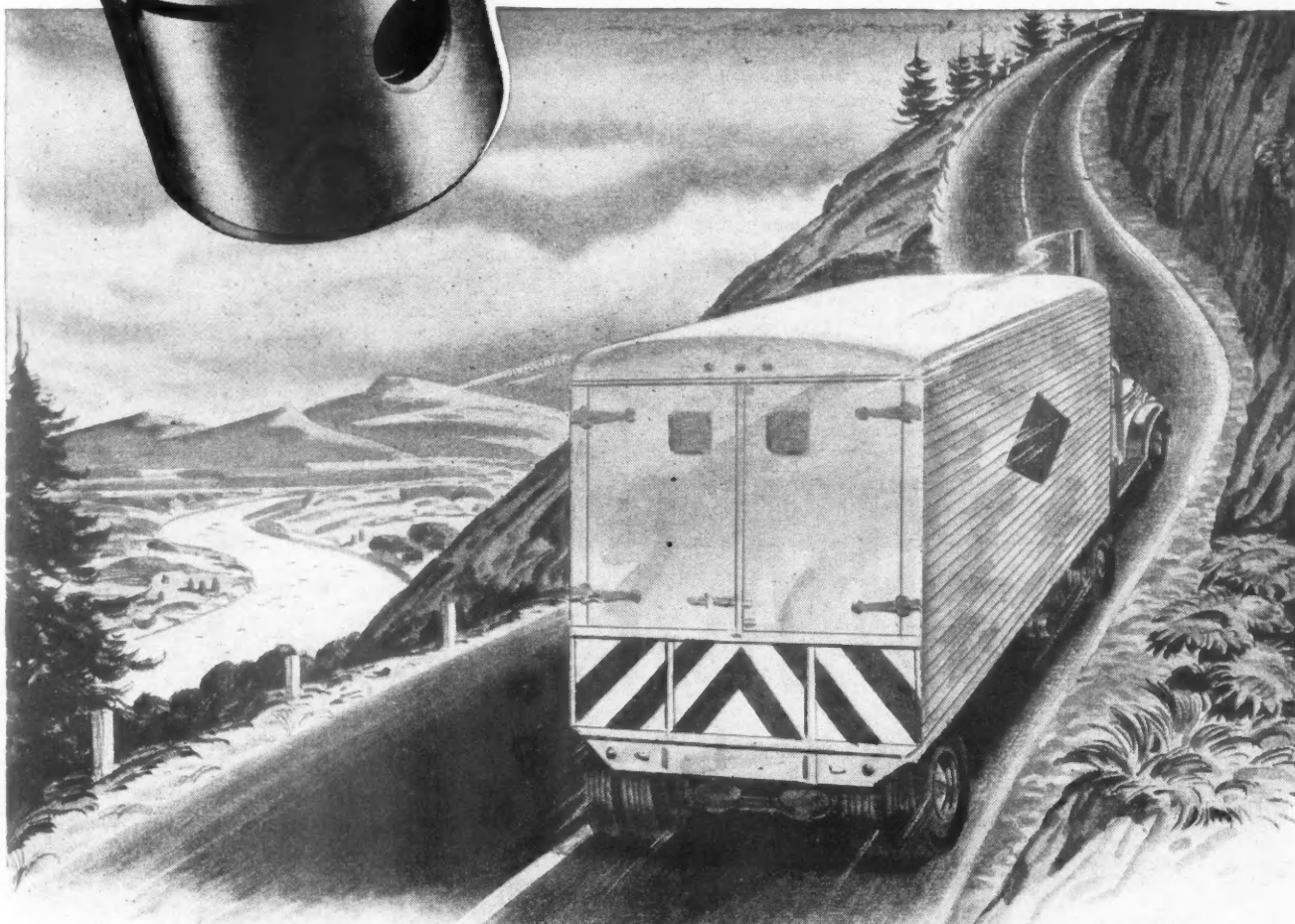
A new synthetic rubber which may equal or surpass natural rubber in tire treads was described recently by John P. Coe, vice-president and general manager of United States Rubber Co.'s synthetic rubber division. He said two large plants are now being equipped to produce the new rubber, which results from research conducted by the synthetic rubber industry under sponsorship of Office of Rubber Reserve.

"Preliminary data have indicated tire tread quality substantially improved over anything achieved heretofore with natural rubber," Mr. Coe said. He added that even the most conservative chemical engineers rate the new rubber as "at least equal to natural, according to preliminary data."

Secret of this improvement in man-made rubber, Mr. Coe indicated, is a sharp reduction in temperature of the chemical reaction by which the GR-S is produced from butadiene and styrene. The new rubber is made at temperatures between zero and 40 deg. F, instead of at the customary 125 deg.



The BIG FLEETS are switching to LO-EX



Hear the beat of that Diesel on the grade? Telling its own story of how Lo-Ex pistons cut costs. 3 ways—

T-SLOT, CAM-GROUND, LO-EXPANSION—pioneered by Alcoa. The T-slot, cam-ground piston of Lo-Expansion alloy gives you closer fit—better compression—at high temperatures without excessive cylinder wall wear.

HIGH HEAT-TRANSFER—Lo-Ex alloy pulls heat from the piston head $2\frac{1}{2}$ times faster than cast iron. That means no localized "hot spots". The piston does its share of cooling—your engine oil is

used more as a lubricant, less as a thinned-out refrigerant.

LIGHT WEIGHT—The lighter weight of Lo-Ex pistons saves engine wear. Bearing loads are cut, vibration held down.

Lo-Ex pistons give you economy—and trouble-free operation—longer than any other pistons. When you order replacement pistons—whatever trade name you buy them under—specify Lo-Ex pistons of Alcoa Aluminum—the finest aluminum piston castings. ALUMINUM COMPANY OF AMERICA, 1916 Gulf Building, Pittsburgh 19, Pennsylvania.

LO-EX *Pistons* of Alcoa Aluminum

Registered Trade Mark



Vehicle Replacement

(CONTINUED FROM PAGE 36)

be kept on a strictly economic basis, with a minimum of distortion from the arts of persuasion and the ties of personal loyalty.

Source of Earnings

THE major source of earnings on capital invested in a truck replacement is cost savings. A new truck

should be bought when the reduction in future expenses will be great enough to earn a satisfactory return on the capital outlay. Earnings should exceed the standard of capital productivity for alternative marketing investments discussed above.

The replacement decision, to be sure, is contingent upon two absolute standards of minimum satisfactory performance: capacity and appearance.

Physical capacity to do the required job effectively (i.e. reliability,

safety, etc.) is not usually determining. Increased repair expenditures could keep old equipment in good working order for almost indefinitely. If old trucks are brought to virtual par with new trucks in service adequacy, then the question is: at what stage does the rejuvenation cost too much? If maintenance is not carried to this parity point, some allowance must be made for the added losses of sub-standard performance. Whether it pay to maintain to the point of performance parity with new trucks is a different problem from ours. Thus it is not the standard, but the cost of keeping trucks up to standard that governs replacement.

The second absolute standard, appearance, is also not determining. Repainting can keep even the oldest of trucks reasonably pleasing in appearance.

Thus neither of these standards is controlling. The real test of truck replacement investment must be profitability of the investment, as shown by estimated cost savings.

Graphic Analysis

THE essence of the economic replacement analysis can be shown by a simple graph. (Fig. 1). The costs of continued use of a vehicle are a function of age and mileage. Hence the behavior of costs with increased use is the key to determination of the cost savings that should govern replacement. Fig. 1 shows cost curves in terms of annual cost for a constant route for a hypothetical \$5000 truck. The curves are theoretical and are designed solely to illustrate the method. They do not portray actual cost behavior of a specific truck. The shape of actual curves differ widely among operators depending upon operating conditions, account classification, standards of preventive maintenance, etc.

The capital wastage cost curve declines sharply at first and then falls off more and more gradually as the truck gets older. The curve shows the market-price depreciation, based on the expected decline in disposal value during each year.

The maintenance cost curve represents the increase in annual maintenance and repair expenditures which will occur over most of the life.

(TURN TO PAGE 152, PLEASE)

Another First by Teleoptic

Teleoptic's

'OK-PASS'

COURTESY LAMP



Lamp, with Chrome door, enameled housing, both of brass. Exclusive green signal lens by Kopp glass.

Complete with momentary contact switch

Here's a new Teleoptic lamp that will earn-for the truck operator-- the thanks of all motorists. Ends flashing of headlights and specifically tells the driver behind whether or not it is safe to pass. Truck driver merely presses a button; when he lets go, light goes out.

ASK YOUR JOBBER

THE Teleoptic Company

1237 MOUND AVENUE RACINE WISCONSIN



IT'S THE *"Spring-back"* THAT COUNTS



PARISH

Heat-Treated Frame

The Keel of the Chassis

Made of special steels and alloys, formed by high-tonnage presses, heat-treated, tested and straightened by competent master craftsmen, *PARISH FRAMES* have a quality that makes them different—the "Spring-back."

Because of the resilience of *PARISH Heat-Treated FRAMES* the parts attached to them are held in correct relation to each other in spite of the stresses and strains caused by a rough road underneath, or a heavy load above; and "spring-back" immediately to their original position. They have a strength value 125% greater than frames made from commonly used steels and last years longer.

When buying new trucks and trailers or replacing worn-out frames, insure longer, trouble-free operation by specifying *PARISH Heat-Treated FRAMES*—the frames with the "spring-back"—the "keel of the chassis."

PRESSED STEEL HEAT-TREATED FRAMES FOR TRUCKS AND TRAILERS

**PARISH PRESSED STEEL CO. *Subsidiary of* DANA CORP.
READING, PA.**

Western Representative: F. Somers Peterson, 57 California St., San Francisco, Cal.

Vehicle Replacement

(CONTINUED FROM PAGE 150)

The operating cost curve rises gradually at a declining rate. This cost might include customary operating expenses such as gasoline, lubricants, tires and incidentals.

The unreliability cost curve reflects an estimate of the direct and indirect losses from increasing undependability as indicated on road breakdowns and idle time for repairs. It

is presumed to rise continuously as the truck ages.

The combined cost curve for the old truck is the sum of the several component cost curves. It declines at first, reaches a low point and then rises when rising maintenance operating and unreliability costs more than offset the declining capital wastage costs.

Average combined cost of new truck is shown in Fig. 2 by the horizontal line. It represents the expected future average annual cost of

a new truck. It is computed by dividing the total estimated cost of the new truck (without interest) throughout its expected useful life by the number of years in its expected useful life.

The point of economic replacement is determined by prospective cost savings from replacement as a percentage of the net capital expenditure required to obtain these savings. Cost savings are shown by the spread between the curve of combined cost of the old truck and the line of life-time average cost of the new truck, beyond their point of intersection. To get the rate of return on investment this cost saving must be related to net capital outlay, i.e. the original cost of the new truck minus the present disposal value of the old truck. When this rate of return equals the minimum standard return (determined by the profitability of alternative uses of company capital funds) then it is economically sound to make the replacement investment. This point is diagramed by the arrow.

Now let us dig into the concepts and estimating methods upon which the method sketched above is built.

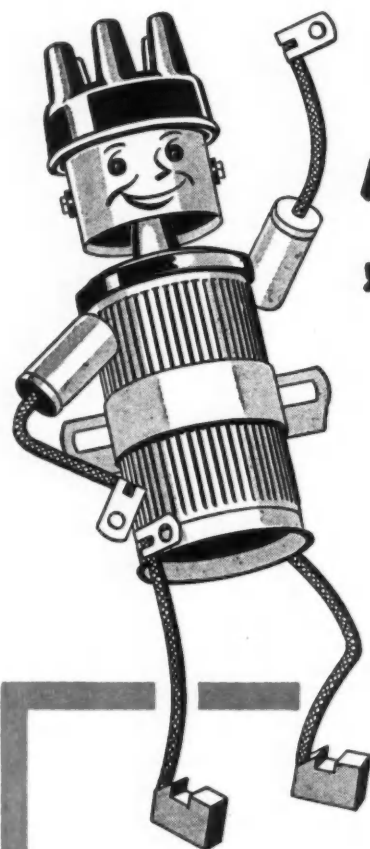
Future Costs

FOR estimating capital earnings of a truck replacement it is not past costs, but future costs which are relevant. True, the records of historical cost are valuable for making this estimate. But they are valuable only to the extent that past costs and present costs can serve as a guide to estimating future costs.

In the case of recurring costs, such as maintenance, losses from breakdowns, gasoline, tires, and other operating items, the costs which were incurred in the past serve as a valid starting point in estimating costs which will be incurred in the future. But past costs of one specific truck are not necessarily the best guide. Average cost of a number of trucks under similar operating conditions probably constitutes a better indication of the cost which will be incurred in the future. These averages need to be adjusted to foreseeable changes in wage rates and materials prices, etc.

Should the cost unit for comparison of old and new trucks be cost per year, per mile, or per service unit?

(TURN TO PAGE 154, PLEASE)



HI!
I AM PEEDEE
YOUR ELECTRICAL HELPER

You're going to see a lot of me. In advertisements and trade shows . . . sales literature and posters . . . window streamers and point-of-sale displays . . . in fact, *everywhere I can help you sell more and better tune-up jobs.*

I will take P&D parts one by one . . . hold 'em in my hand and open 'em up for you . . . show you from the inside out that my complete line of starting, lighting and ignition parts is the finest available in quality and workmanship. And I'll prove to you why this means more satisfied customers for you . . . keeps you ahead of competition.

So watch for me — and see how the P&D line can make quick, real profits for you.

Turn out better tune-up jobs with Pee Dee



P&D

MANUFACTURING COMPANY, INC.

LONG ISLAND CITY 5, N. Y.

STARTING • LIGHTING • IGNITION

"Friction-Engineered" Axle Sets

FOR EVERY BRAKING SYSTEM

MANUAL • VACUUM • AIR

● Every set of American Brakeblok lining is "friction-engineered" to meet the requirements of specific makes and models of vehicles.

All the braking factors peculiar to each car, truck or bus are carefully taken into consideration to make sure each set of lining has the right combination of braking values for maximum safety and economy. Altogether, American Brakeblok manufactures twenty-five different types of friction material—assuring a correct brake lining for every fleet unit.

American Brakeblok is an entirely different and better kind of lining—a lining that's the *same all the way through*. It wears smoothly, evenly . . . provides constant friction value throughout its life . . . has stable braking characteristics under the highest temperatures and pressures of heavy-duty service. And the fact that it is non-compressible under all braking pressures eliminates the need for frequent adjustments.

For best results, always reline with American Brakeblok. Your maintenance records will prove it pays. Just call your nearby NAPA Jobber—give him precise information on the make and model of vehicle and its braking system. He'll supply you promptly with American Brakeblok axle sets, "friction-engineered" to meet your exact needs.



American Brakeblok is distributed through 39 NAPA Warehouses, assisting jobbers everywhere to give prompt, complete service.



AMERICAN
Brake Shoe
COMPANY

AMERICAN BRAKEBLOK DIVISION
DETROIT 9, MICHIGAN

3 DISTINCT TYPES OF HEAVY-DUTY BRAKE LINING



REGULAR: Recommended for vehicles with manual brake systems. Also usable on vacuum or air brake systems, but may produce needlessly severe brake action, thus shortening service life. Available in rolls, complete sets and axle sets.



1,000 SERIES: Engineered primarily for vehicles with vacuum power booster systems. Also recommended for air brake systems where there is need for greater deceleration than is provided by 2,000 series. Available in axle sets only.



2,000 SERIES: Designed to give maximum mileage and efficiency when operating under extreme braking conditions with air brakes or powerful vacuum systems. Available in axle sets only.

"C" SERIES: Thick blocks to be used on air brakes only (or powerful vacuum systems).



American
Brakeblok
BRAKE LINING

Vehicle Replacement

(CONTINUED FROM PAGE 152)

Each of these cost units is satisfactory under some circumstances.

Cost per service unit (e.g. ton mile) is usually more adaptable to a variety of route conditions. But even so it fails to reflect them completely and it often is less closely related to truck cost behavior than some other unit. If size balance of the fleet has

been substantially attained and replacement is confined to trucks of equal size for approximately the same route, then cost per year is an adequate basis for a comparison of future costs of the old and new truck.

Averaging Costs

TO make a valid comparison for purposes of a replacement decision all costs of the new truck must be life-time and averages. Why is this so? If we compared the cost of operating an old truck for the next

year with the cost of a new truck for the first year of its life, we would arrive at thoroughly misleading conclusions. It is incorrect to consider only the costs which will be incurred early in the new truck's life, when maintenance and repair charges, for example, are known to be low. The decision to keep the old truck in operation makes only a short period commitment, to use the old truck for another year or even less. But the alternative decision to buy a new truck makes a long-term commitment to incur costs of running this new truck throughout its economic life. You are committed to the whole course of the maintenance curve, not just to its low initial phase. Hence it is the lifetime average level of the curve that is relevant for the new truck.

The economic life of the new truck is unknown; yet it must be forecast for this and other purposes. "Economic life" varies not only among makes but also among users depending upon type of service and standards of preventive maintenance. Ultimately it depends also upon the way the replacement decision is made.

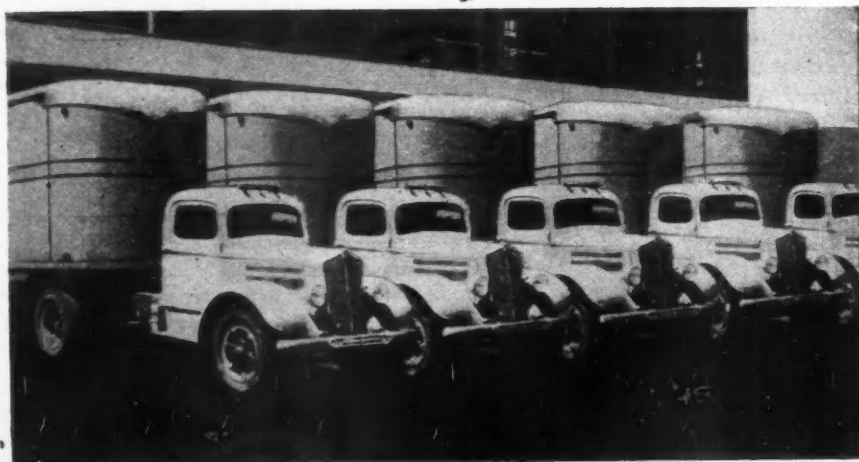
To estimate economic life it is necessary to consider probable obsolescence. This involves a guess at the age (in years or miles) at which cost savings (over and unborn new truck) will give a high enough payout to justify replacement of the truck you now consider buying. It is obviously impossible to do this accurately, yet it will be better done if we recognize the concept we are guessing at. Actually we do, or should do this each time we set a depreciation rate. In a sense the only sure way to find the point of economic replacement by experience is to go past it. War conditions have given some operators this instructive experience, so that they have a historical bench-mark for estimating future economic life, to be modified for changed conditions.

In using past replacement experience as a bench-mark adjustments must be made to take account of the changed construction of new trucks and changed operating conditions. But the biggest hazard is the rate of future obsolescence. Hence it is probably safer to err in the direction of underestimating economic life.

(TURN TO PAGE 156. PLEASE)

ROAD TIME PAYS DIVIDENDS

*Keep 'Em Rolling
and Paying*



with



Repair lay-up time is reduced more than 40% when trucks are Hypressure Jenny steam cleaned before your mechanics start working on them. That means you get them back on the road in practically half the time. Periodic Hypressure Jenny steam clean-

ing often reveals worn and damaged parts for repair before dangerous, time-consuming, road failures occur . . . increases pay loads by ridding chassis of as much as 400 lbs. extra weight due to accumulated road dirt . . . assures more economical operation . . . reduces fire hazards. Besides keeping your fleet "rolling and paying," Hypressure Jenny further adds to your profits by cleaning garage floors, runways, grease racks, pits, tools, machinery, walls, windows and skylights 8 to 10 times faster and better than by hand methods.

Write today for further particulars and the address of your nearest Hypressure Jenny Dealer.

HYPRESSURE JENNY DIVISION

HOMESTEAD VALVE MANUFACTURING CO., P. O. BOX 99

CORAOPOLIS, PA.

**IT'S NEW!
SERVICE TESTED!
PROVEN!**

Whitaker "707" SPARK PLUG CABLE

a superior quality, 7 copper strand — 7mm neoprene heavy duty cable having these important features:

- RESISTS CONSTANT MOTOR HEAT
- WILL NOT CRACK UNDER EXTREME COLD
- WITHSTANDS DESTRUCTIVE FRICTIONAL WEAR
- CANNOT BE PENETRATED BY MOISTURE
- IMPERVIOUS TO DAMAGING GREASE
- REPRESSES CORONA
- REPELS OIL

**RESISTS
HEAT!**

**RESISTS
OIL!**

**RESISTS
COLD!**

**RESISTS
ABRASIONS!**

**RESISTS
MOISTURE!**

**RESISTS
GREASE!**

**RESISTS
CORONA!**

It's heavy neoprene insulation that does it! The NEW Whitaker "707" resists damaging elements that cause early cable deterioration and resistance to full delivery of power. Sold through leading jobbers everywhere.

★ ★ ★

WHITAKER LABEL
Assures Quality Cable

WHITAKER
CABLE CORPORATION

Pioneers and Leaders in Automotive Cable Products Since 1920

KANSAS CITY, MO.
ST. JOSEPH, MO.
PHILADELPHIA
LOS ANGELES

Vehicle Replacement

(CONTINUED FROM PAGE 154)

To make a forecast of the economic life of a new truck might appear to beg the question, but, actually it does not, because the question at hand is whether the specific truck now in operation has reached the end of its economic life. To make estimates of the normal economic life of a group of similar trucks and to use

such estimates in determining the economic life of one particular truck is, therefore, fully defensible for a new truck.

It is clear that the amount of the average life-time cost of the new truck, and, therefore, the conclusion drawn from the cost-savings comparison itself will be greatly affected by the length of span over which the average is computed. Hence, determination of the period of probable economic life of a new truck justifies the best possible forecasting.

Capital Wastage

CAPITAL wastage is the disappearance of investment value as a result of use or the passage of time. It must be taken into account to get net earnings for estimating capital productivity. For capital budgeting purposes, the element of return on money should be viewed not as a part of capital cost but as the unknown end product of our analysis. Since it is the magnitude of the capital return that determines what the replacement decision should be, this element is, for present purposes, not considered a "cost" of capital. Return on a \$10,000 net investment for truck replacement is the cost savings. If they were \$2000 a year, the investment return would be 20 per cent.

The original acquisition cost of a truck that is now in operation is sunk and irrecoverable. It can in no way affect the future money outlays or the future real profits of the company. The depreciation charges shown on the books (though they can affect the timing of the company's recognition of its profits or losses) are similarly independent of the company's real future costs and real future profits. Hence, the acquisition value and the accrued depreciation must be dismissed entirely from consideration in the comparison of future costs of an old truck with future costs of a new truck. These bookkeeping values may be perfectly sound for financial bookkeeping and income tax purposes. Nevertheless, the book value of an old truck is not of any significance in making a decision on whether to replace or not.

The only real future capital wastage costs of a present truck will arise from the future decline in the disposal value of that truck. For example, if a truck can now be sold for \$8000 and next year can be liquidated for only \$6000, then the additional capital loss which the company will incur by keeping that truck in operation for another year is \$2000. The capital cost of retaining a present truck in operation is its future decline in liquidation value. This holds true no matter what the cost of the truck was when originally purchased, no matter when that purchase took place, and no matter how much depreciation has been charged for financial accounting purposes.

(TURN TO PAGE 158, PLEASE)



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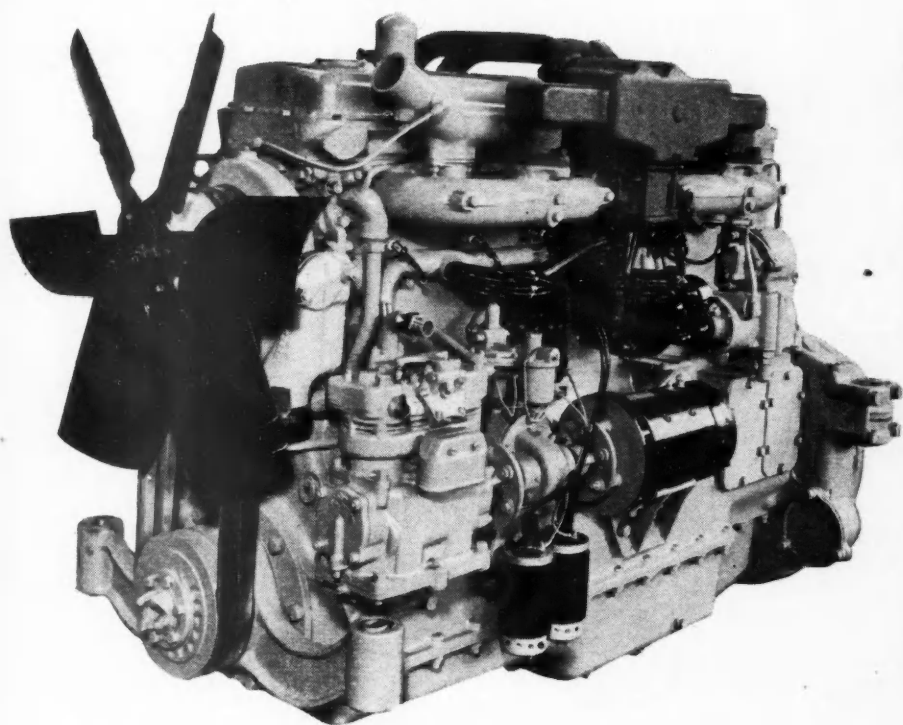


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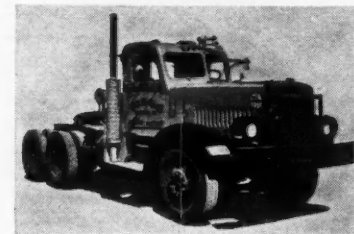
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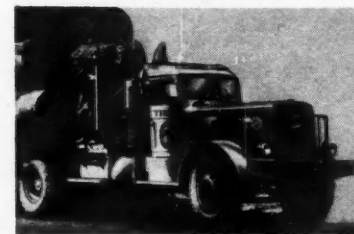
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Vehicle Replacement

(CONTINUED FROM PAGE 156)

The problem of estimating capital wastage cost for the old truck consists, then, of (a) surveying the market to see what the truck in question can now bring, and (b) estimating the amount which will be realized if the truck is kept longer (e.g. sold one year hence).

Fig. 3 illustrates the kind of esti-

mate of the behavior of normal disposal value that is needed for this purpose. It portrays disposal value of a light truck as a function of age. The top curve shows estimated disposal value at the end of each year. The bottom curve described by the bars, shows the loss in disposal value during each designated year. This derivative curve represents the capital wastage cost which will be incurred by retaining the old truck in operation. It is this shrinkage in market value which is relevant for

determining whether the present truck should be replaced. The capital wastage curve in Fig. 1 was developed in this way from normal values.

Shifts in the disposal value curve may occur as a result of rising prices of new trucks or from a dramatic change in the shortage of new and used trucks. As we approach the end of this shortage epoch the probability of a break in used truck prices should be included in the replacement cost comparison. These shifts complicate the estimates of future decline in disposal value. The economic method is capable of dealing with this problem, within the limits of accuracy of forecasts of the shifts. Fig. 4 illustrates the technique. Curve A represents the disposal value function now, Curve B is this forecasted curve one year hence. To estimate the future capital wastage we must hop from the age two value on Curve A to the age three value on Curve B, instead of moving down one year on Curve A as in a normal market. Thus on the diagram the estimated future decline in disposal value is the distance D instead of the normal wastage C. For very old trucks the age decline becomes negligible and the market shifts may become relatively more significant in estimating capital workage.

Even when the company's policy is to trade-in or to junk retired equipment, rather than sell it second-hand, it is, I think, sounder to have the market price of used trucks be the criterion for replacement decisions. Trade-in values are often distorted by new truck scarcities or veiled concessions. Junk prices are correct enough if this is the best obtainable price, but junk sales to keep trucks from competing with you is an incorrect value guide for replacements.

True, the truck you have owned since birth has more value to you than a truck of the same vintage bought second-hand. You know your own truck's care and condition and you rightly suspect the worst of the used vehicle. But it is not the level of the disposal value curve, but its rate of decline that affects this replacement test. If a constant premium were added to the disposal value curve to reflect high use value from known condition of the truck, the capital wastage function would

(TURN TO PAGE 162, PLEASE)

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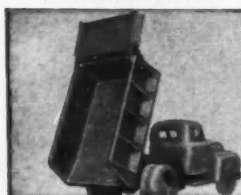


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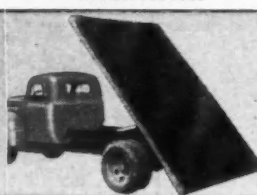
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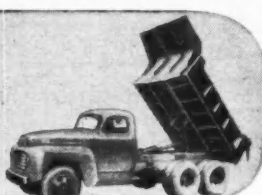
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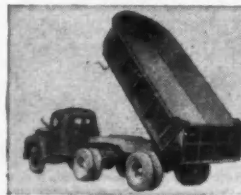
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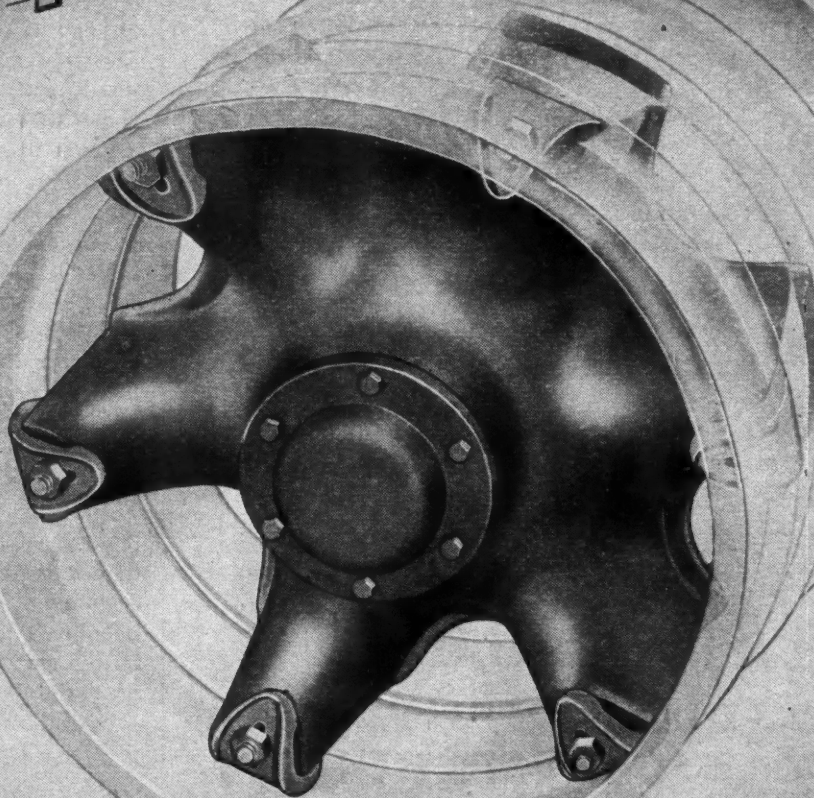
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Vehicle Replacement

(CONTINUED FROM PAGE 158)

remain the same. Moreover, disposal value rather than your own use-value becomes the relevant value eventually, and this analysis is designed to find out whether or not "eventually" is "now."

The total capital wastage cost which will be incurred by buying a new truck is its original acquisition cost, less its ultimate re-sale value.

Since the unit of cost comparison in this illustration is one-year, the appropriate capital wastage cost for the new truck will, therefore, be the average annual capital wastage cost over the entire period you expect to own it.

Are the two concepts of capital destruction fully comparable for our purposes? I think so. For the new truck capital wastage is the difference between original cost and eventual disposal value, averaged annually over the expected economic life of

the new truck. For the old truck, wastage is the present disposal value less the amount of money which could be realized later, if not replaced now. (Shown by bars in Fig. 3.) Both represent the additional real costs of the alternatives being compared. The added capital shrinkage of keeping the old truck is the decline in disposal value. This is the future cost controllable by the decision to keep it another year. Its original cost is sunk and therefore irrelevant. But for a new truck not yet purchased it is its original cost (less ultimate disposal value) that is the comparably fully controllable future cost.

The two concepts of capital wastage are also consistent as life-time totals. The annual capital shrinkage figures shown in wastage curve of Fig. 1 will add up to original cost less ultimate disposal value (i.e. at the end of projected economic life). The vital difference between a market disposal value curve and a book value curve as shown in Fig. 5, is in the time distribution of values not in the aggregate amount accounted for. Disposal value is based on economic facts of the market place; this is illustrated by curves A and B of Fig. 4. Both curves are based on the same ultimate disposal value at the end of a 7-year projected economic life. Hence both show the same aggregate life-time capital wastage. The disposal value estimate is based on economic facts of the market place. The capital shrinkage derived from it (curve C) is high the first year, then falls to zero the last 3 years of economic life. The year to year distribution of capital wastage indicated by the conventional straight line depreciation is quite different. It is exactly the same each year (as shown in Fig. 5 by Curve D, derived from curve B, Fig. 4). It is this time-distribution, not the life-time aggregate which does not square with market facts, and hence cannot be used in projecting the added capital wastage of operating the old truck another year.

Maintenance Costs

THE relevant comparison of the maintenance costs of the old truck and the new truck is between (a) expected future maintenance costs of

(TURN TO PAGE 164, PLEASE)



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Vehicle Replacement

(CONTINUED FROM PAGE 162)

the old truck during the next year, and (b) average annual future maintenance cost of the new truck over its expected economic life. Both of these items of comparison are, necessarily, estimates. But for both of them, the historical records of past costs will be valuable aids to projection. In most instances the individual maintenance cost records for the old truck will be

less valid as a basis for estimate than will be average past maintenance costs for a number of similar trucks in similar operating circumstances. These past costs, even though they are averages, should not, however, be taken as estimates themselves. Rather, they are starting points only, which need to be modified, adjusted, and improved in the light of whatever additional knowledge and judgment are available at the time of the estimate. Changes in wage rates, in parts prices, and in routes, all are

factors which will affect future costs and should be taken into account in developing the estimate.

In estimating the expected maintenance for the old truck during the next 12 months, it is well to separate major repairs from recurring maintenance. The cost of a contemplated major repair should be amortized over the expected life of that repair job to obtain its annual average cost. Sometimes the added life can best be estimated in mileage then converted to years. The estimate of recurring maintenance expected for the next year can be developed from life cycle curves for similar trucks in the same service. These must be adjusted to reflect wage rates and parts prices expected during the next year. This actuarial figure needs also to be modified to take account of the history and condition of the individual truck under consideration.

Maintenance cost probably does not increase indefinitely with age. The average age of parts does not continue to increase after the truck has been properly maintained over several hundred thousand miles. The level and shape of the maintenance cost curve will differ among companies depending on standards of preventative maintenance, methods of classifying accounts and character of truck route.

The shifts of the curve caused by changes in wages, productivity and parts prices are also a major consideration in forecasting maintenance costs. These shifts are illustrated by Fig. 6. Projection involves hopping from curve to curve as well as moving to a higher age bracket.

For the new truck an estimate of life-time average annual maintenance cost is needed. It should be built up by adding estimates of maintenance costs during each of the years of expected service. This will include anticipated major overhauls as well as all recurring maintenance and repair expense. In developing this estimate, consideration should be given to average maintenance expense of similar trucks in their various years of service in the past, but adjustments should be made to give effect to expected price levels, wage rates, labor efficiency and shop conditions. Maintenance inaccessibility that is characteristic of many new models must also modify the maintenance

(TURN TO PAGE 166, PLEASE)

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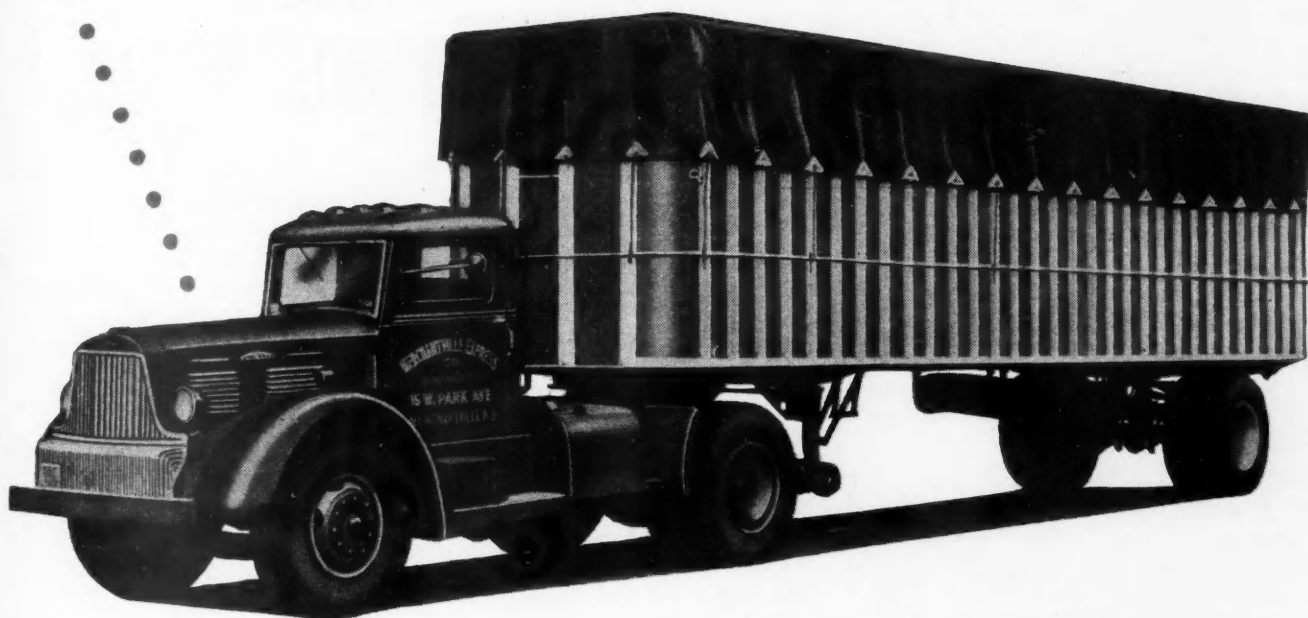
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Vehicle Replacement

(CONTINUED FROM PAGE 164)

estimate based on past experience. This life-time total of maintenance expense should then be averaged over the expected life of the truck.

Operating Costs

LIKE maintenance costs, the future operating costs must also be estimates. To an important degree historical cost records can form the groundwork for the estimates. Better estimates can be developed from averages of much similar trucks than are obtainable from the records of one individual truck.

The expected cost of gas and oil for the old truck during the next twelve months can best be determined by first estimating a per-mile cost and then multiplying the per-mile cost by the expected annual mileage. Past costs of the same truck and average costs of similar trucks in similar operating conditions will serve as a basis of estimate. Tire cost should also be estimated on the basis of per-mile tire costs. For new

trucks a life-time average should be developed by parallel methods.

Many fleet operators find that operating costs (gas, oil and tires) rise only slightly with truck age. Much depends on maintenance and care standards. Omission of these costs from the replacement comparison is a warranted simplification if this cost curves rises only slightly. Estimating errors of more differentiating costs may make operating cost differences negligible. However, if future new trucks promise significant fuel savings omission of these costs will make the test fail to detect operating cost obsolescence.

Unreliability Cost

OLDER trucks may be more unreliable. Losses which result from truck break-downs or other idle time occasioned by lay-ups for repairs should therefore be included in the comparison. Developing estimates of this cost will involve two steps: (1) Estimating the idle time in terms of days, and (2) placing a money valuation on the losses, largely on idle time in the form of a per-idle-day cost. The first is comparatively easy

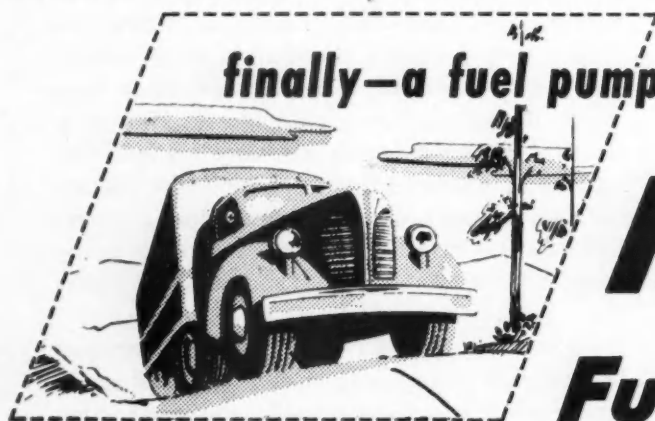
if good records of past experience are available. Dependability will be affected by maintenance standards, hence changes must be reflected. The second requires much guess work, for the indirect costs should be included, and they are often large and hard to quantify. One approach is to use the day costs of a comparable unit from the relief fleet. Another is to take the market rental figure. To these must be added costs of idle crew, towing costs, etc., for on-the-road breakdowns.

Unreliability costs may be such an important difference that even a rough evaluation is much preferable to omission of the cost from the comparison.

Earnings and Investment

A ONE-YEAR cost comparison using the foregoing estimates of cost will provide the answer to the question of whether replacement is justified on the basis of capital earnings in the form of future cost savings. In general terms the answer can be stated thus: The present truck should be replaced if its expected

(TURN TO PAGE 168, PLEASE)



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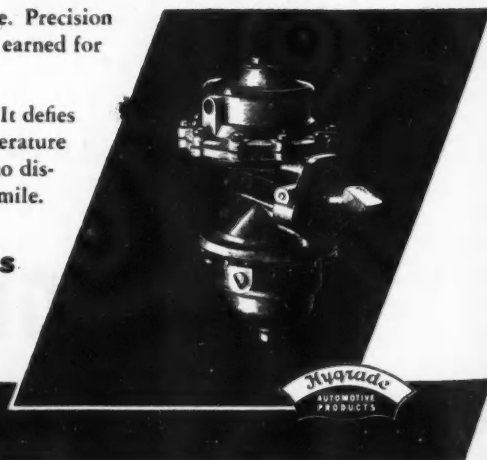
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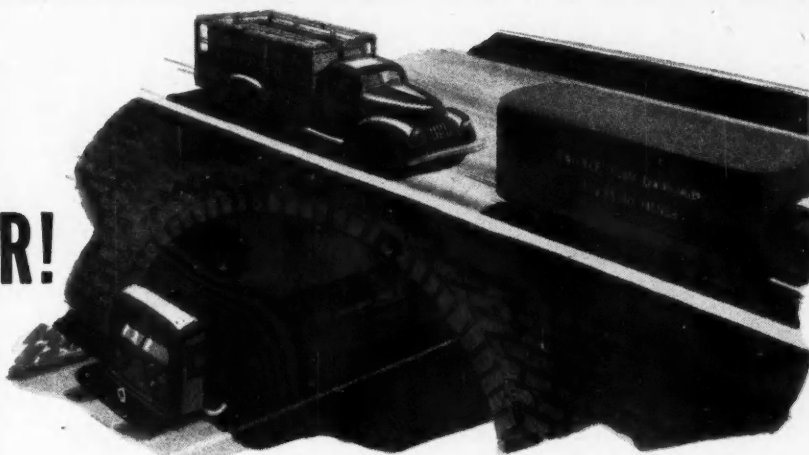
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Vehicle Replacement

(CONTINUED FROM PAGE 166)

costs (both capital and operating) during the next year are higher than the average annual costs (both capital and operating) of a new truck by a sufficient margin to yield an adequate cost-savings return on capital. Otherwise the present truck should be retained and kept in operation.

In order to get an earnings rate you must determine amount of capi-

tal tied up in the replacement investment. This can be obtained by finding total outlay for the new asset (including all acquisition and installation charges) and subtracting from this the present disposal value of the asset which is displaced by the new acquisition. This is the amount of money on which the company will forego earnings elsewhere if the truck is now replaced. This net outlay is the correct concept for these reasons:

1. The annual savings is a com-

parative figure representing the superior efficiency of the new truck over the old. Therefore, the outlay to which it is related should also be a comparative figure, showing the additional investment required to achieve these savings.

2. The current disposal value of the old truck is the amount of capital which the company will receive if it is decided to replace it.

3. The eventual liquidation value of the new truck when it is replaced many years hence has no bearing for this calculation, since that money is still tied up and must show earnings to justify the investment. It is relevant only for determining the depreciable total from which to calculate annual capital wastage, which is an entirely different problem.

4. The book value of the old truck is not relevant for determining the net amount of present investment. If the truck were sold and replaced with a new one it would not be the book value but the present disposal value which would become available for investment elsewhere.

Obsolescence

A PROBABLE consequence of making motor vehicle replacements compete on a payout basis with alternative investments of the company's capital is a substantial reduction in retirements, so that obsolescence may become the dominant cause of truck replacements.

Truck obsolescence comes from several sources. Substantial improvements in fuel cost, in legal load, in maintenance accessibility, in cab comfort or in speed could make some existing equipment obsolete. Advances in body design so as to save motions and incorporate the latest material-handling equipment could make bodies and trucks obsolete.

To determine whether such improvements have actually made your existing truck obsolete requires exactly the same kind of analysis we have just discussed. The only economic test of obsolescence is cost savings, translated into return on investment. Only by comparison of (1) the added costs of continuing to run your old truck with (2) the full lifetime cost of the new truck can this acid test be applied. If costs are in terms of service units, an exten-

(TURN TO PAGE 212, PLEASE)

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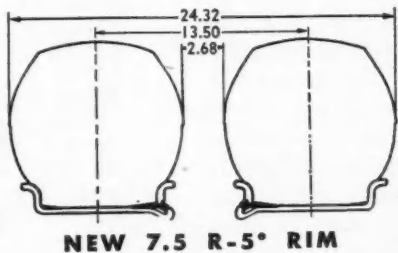
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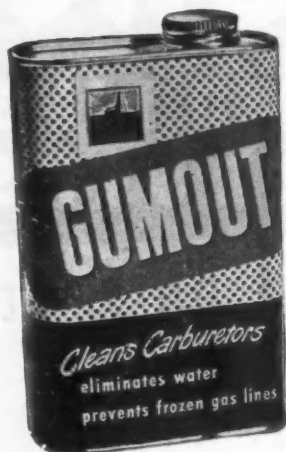
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Vehicle Replacement

(CONTINUED FROM PAGE 168)

sion of our basic method to include labor costs will provide a positive test of obsolescence. It will not detect all kinds. Style and cab comfort obsolescence, for example, will be missed. But it will catch any that has direct impact on the unit costs that can be included in the analysis. These are for most operators the significant kinds of obsolescence.

This index of obsolescence has wide error margins unless used skeptically. For example, theoretical savings in drivers' time are rarely actually realized in full. Speed obsolescence will be largely a fiction until billions have been spent in highway improvement. Estimates of life expectancy of the new model, which affect the findings on obsolescence importantly, involve a rough forecast of the timing of unborn technical advances which will in turn make the new model obsolete. But this is a limitation implicit in all obsolescence criteria.

Replacement Test

WHEN should a replacement test be made? There can be no rigid rule. But an understanding of the underlying economics of the retirement test, coupled with intimate knowledge of the truck's condition, will indicate when it appears sufficiently likely that a new truck would pay out, to warrant a cost comparison analysis. Except for "lemons," replacement need not normally be investigated until the truck is near the end of its forecastal economic life (e.g., $\frac{3}{4}$ depreciated). It is desirable to check it again about once a year. This routine should be set aside and a replacement analysis should be made when a major overhaul is contemplated, when maintenance wages and parts rise drastically, when a dramatically new model becomes available, or when the market price of used trucks appears likely to fall very fast.

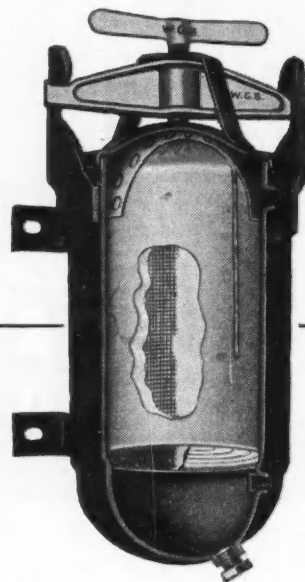
Limitations of Method

NO method of determining when to replace a vehicle is without its limitations.

Now that I have called attention to
(TURN TO PAGE 214, PLEASE)

WGB

CLARIFICATION



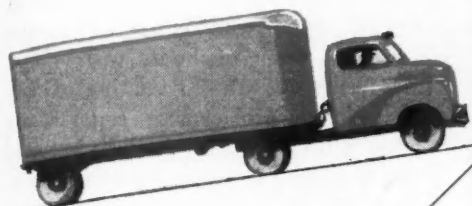
IS MAXIMUM ECONOMY

MR. FLEET OPERATOR: When you received your Autocar, Brockway, Buda, Diamond T, General Motors or Mack motor equipped with a WGB ClarOfier, you obtained the best filtration that money can buy—provided you use genuine WGB Cartridges, which are covered by patents preventing duplication. But if you use substitutes, which are prevented from using the WGB principle, you cannot expect WGB economy or motor protection.

The results which induced these manufacturers to equip their fine motors with WGB Oil ClarOfiers were obtained by use of the complete unit. It is not WGB filtration unless genuine WGB Cartridges are used. Substitutes cost more, because they do less. Be fair to yourself, to your motor and to the WGB ClarOfier. Use genuine WGB Cartridges and you'll get the economy, efficiency and motor protection which the manufacturer intended you to have.

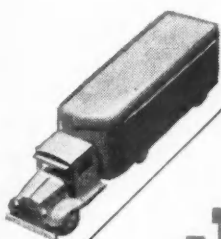
WGB

OIL CLARIFIER, INC.
KINGSTON, N. Y.



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...a requirement for old..



the best brake is **AIR**

Buyers of new trucks are specifying Bendix-Westinghouse Air Brakes in ever-increasing numbers, because they have learned that these brakes start paying their own way *from the first mile*. The operators of older vehicles are also following the swing to AIR. They recognize the obvious value of adding that extra margin of modern safety to a vehicle that has already rolled up thousands of miles. On old or new vehicles service costs are less, payloads safely made larger, scheduling more efficient, and driver satisfaction greater. The first mile or the 100,000th—the Best Brake is AIR—and the best Air Brakes are, of course, built by Bendix-Westinghouse.

BENDIX-WESTINGHOUSE AUTOMOTIVE AIR BRAKE COMPANY, ELYRIA, OHIO



the best **AIR** brake is

Bendix-Westinghouse

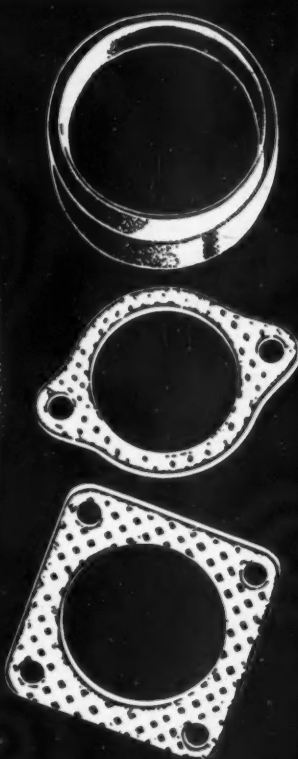
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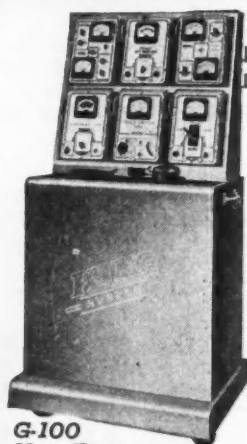
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The
APRIL
Issue
of
COMMERCIAL
CAR
JOURNAL
Will be
the 12th
"FLEET
OPERATORS'
REFERENCE
ANNUAL"
•
Don't
Miss It

Vehicle Replacement

(CONTINUED FROM PAGE 212)

the defects of other methods I must pay for my fun by pointing out the deficiencies of my own plan. The limitations summarized below are not all peculiar to the economic method. Most apply with equal or greater force to other methods.

1. Errors of Estimating Costs. Since the replacement criteria are forward looking, the analysis is based on projections. These projections of future costs will have error margins. The size of these estimating errors will depend in part on how much knowledge you have of past patterns of cost behavior, and in part on ability to forecast the impact of future changes in conditions. Nevertheless, there will be less error from moderately good estimates of a correct concept will be than from the fictitious accuracy of precise figures on an irrelevant concept, which is, I believe, the alternate to this approach.

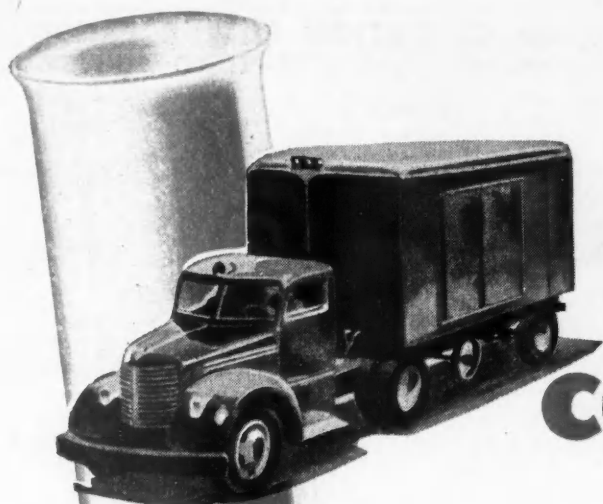
2. Errors of Estimating Economic Life. The estimate of the life-time unit cost of the new truck hinges on the accuracy of the projection of the length of its economic life. Dependent as it is on future durability, maintenance cost and obsolescence, this mortality estimate is bound to be inexact.

3. Requires Research and Analysis. To make good cost projections requires some research in cost behavior, based on records of past performance. But the records need not be different or more detailed than you want for other purposes. The only change is to subject them to economic and statistical analysis. The "economic" method also requires paper work analysis of individual vehicles to reach a replacement decision. But this is a small cost when so much is at stake. Actually, the entire replacement analysis can be put on a one-page form.

4. Requires Training. To get the full benefits of this replacement plan it is necessary that your staff and your superiors know what they are doing and why. They must have some understanding of the economic analysis and capital budgeting concepts on which it is based.

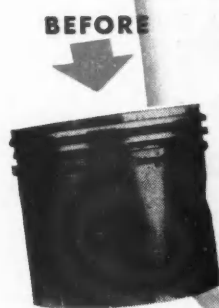
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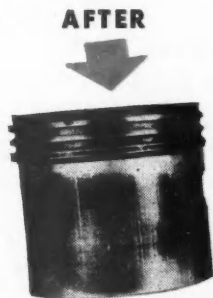


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WHY EXPERIMENT? Laboratory tests prove Wolf's Head is Best



Piston removed from engine operated under heavy duty service using a *competitive heavy duty oil*. Condition of piston. Compression ring stuck. Oil ring 100% carbon-filled. Coating of black varnish on piston skirt.



Piston in its existing condition was then reinstalled in same engine and operated under heavy duty service for only 25 hours using Wolf's Head Heavy Duty Oil. Result: Compression ring free. Carbon dissolving. Varnish disappearing.

Experimentation with different oils can prove very costly, but you do not have to turn your fleet units into individual testing laboratories. Wolf's Head has been tested *for you* time and time again in world famous laboratories . . . and consistently proven superior on all five essential heavy duty factors. That's why it pays to use Wolf's Head Heavy Duty Oil. It shortens down-time, lowers costs . . . by lengthening the life of the engine.

Remember. The fleet on the road is the fleet that makes money. So send for your copy of the free booklet describing these tests. Read for yourself how Wolf's Head can step-up the performance of your fleet. Wolf's Head Oil Refining Co., Inc., Oil City, Pa., New York 10, N. Y.

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CAPACITY
75 TO 125
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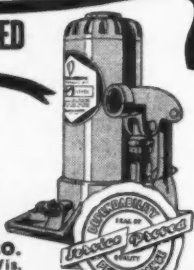
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Pressure Clix

- Signal device for lost oil pressure—lost air pressure in braking system on gasoline and Diesel engines.

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MILEY BLACK GOLD Metallized BRAKE LININGS

are guaranteed not to score brake drums

L. J. MILEY COMPANY

18 S. Sangamon St., Chicago 7

CCJ Newscast

(CONTINUED FROM PAGE 94)

HOME TOWN NOTES

Baltimore: A new Highway Trailer Co. direct factory sales and service branch at 6401 Erdman Ave.

Detroit: A new Borg-Warner Service Parts Co. warehouse at 1345 East Milwaukee Ave.

Houston: U. S. Equipment Co., 41 Jacinto St., now handles Ruger hydraulic cranes and presses.

Jacksonville: Southeast Wheel & Rim Co., Inc., is new distributor for Brown Industries (Spokane, Wash.) aluminum trailers.

Louisville: Louis Augustus, Inc., now handles Kentucky Trailers. Company has branches in Indianapolis, Evansville, Nashville and Knoxville.

St. Louis: Borbein-Young and Co., wheel, rim, brake and spring specialists, have opened an ultra modern plant at 3663 Forest Park Ave.

Tampa: Mack Trucks, Inc., has a new direct factory branch.

ATA REGIONAL MEETINGS

Eight regional meetings at which leading executives of the trucking industry will discuss current operating problems have been scheduled by the American Trucking Associations, Inc. The meetings are designed to supplement the annual business sessions of the association and will place primary emphasis on highway safety and courtesy. Dates and places are as follows:

New York City, Hotel New Yorker, April 8-10; Atlanta, Ansley Hotel, April 13-15; Detroit, Hotel Statler, May 10-14; Fort

It's rumored that...

more than 1,450 fleets are now using Perfect Circle's Fleet Survey Plan! Right, and with its help they've been able to cut operating and maintenance costs. For information on how the Fleet Survey Plan can help you, see your P. C. representative or write: The Perfect Circle Companies, Hagerstown, Ind., U. S. A. and Toronto, Ont., Canada.

Worth, May 18-20 (tentative—no hotel announced); St. Paul, St. Paul Hotel, June 2-4; Salt Lake City, New House Hotel, June 8-10; San Francisco, Palace Hotel, June 14-16; Boston, Statler Hotel, July 12-14 (also tentative).

The Detroit meeting is to be combined with the annual spring meetings of ATA's Department of Safety and the Equipment and Operations, Customer Relations, Accounting and Freight Claim sections.

(TURN TO PAGE 218, PLEASE)

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You Can't Go Wrong!

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Available Trucks

1 1/2 TO 20 TONS

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**BUILT ENTIRELY FROM
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The variety of standard body parts offered by Hart Pressed Steel Corp. enables you to build to any design!

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Parts for this new Full View Single Unit are the result of thousands of dollars expended on development, testing, and engineering—designed to be competitive for the body builder and more economical for the fleet owner.

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Gain uniformity of style regardless of where built! Get immediate delivery of replacement parts for quick repair.

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THE Complete
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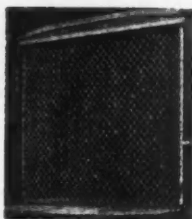
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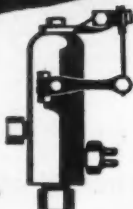
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Pull Out Dash Control.
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Your Brakes Are Locked!
Write for information.

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HARD FACED VALVES

Your used valves rebuilt
for
better performance and economy.

LONGER SERVICE OVER UNPROTECTED VALVES

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Please send information and price list.

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STREET
CITY STATE

SEMA ADOPTS NEW STANDARD FOR SAFETY EQUIPMENT ITEMS

Safety Equipment Manufacturers Association, at its annual meeting recently in Chicago, announced that its members are committed to the manufacture of all items of safety equipment in conformity to National Commercial Standards.

Recently the American Association of Motor Vehicle Administrators announced its "One Test for the Entire Country" plan, under which AAMVA will certify to the individual States all items of equipment conforming to the requirements of either SAE Specifications or National Commercial Standards for After-Market Equipment, to the end that eventually all equipment will be approved according to uniform specifications at one central point rather than to have approvals handled in each state individually as has been done in the past.

As the original sponsors of National Commercial Standards for after-market equipment, SEMA will sponsor Commercial Standards additional to those already adopted with the end in view of Commercial Standards for all items of equipment required to be approved by the Interstate Commerce Commission or the various States.

Additionally, all items of equipment so constructed by SEMA members and certified by AAMVA as having been laboratory tested and found to comply with National Commercial Standards will be covered by a Re-examination Service under which the testing laboratories will semi-annually re-examine samples purchased on the open market to insure all-time compliance with adopted standards.

As soon as original laboratory tests can be brought up-to-date and re-examinations can be scheduled, SEMA members will mark each item of equipment and each carton in which each item is packed with a distinctive mark indicative of such original laboratory testing and re-examination.

Such labeling of products and cartons, when coupled with the "One Test" supervised from AAMVA headquarters, SEMA believes, will go far toward insuring the universal production of high-quality equipment which may truly be designated "safety" and will provide the vehicle user with a ready means of identifying equipment constructed to his needs and conforming to the requirements of all states through or in which his vehicles will operate.

(TURN TO PAGE 220, PLEASE)

Specify
Claw
Double-Duty
TRUCK CHAINS
Columbus McKinnon Chain
CORPORATION
TONAWANDA, N. Y.



Specialists in the field of
Fluid Carriers

THE DAVISBILT PRODUCTS CO.

Affiliated with Liberty Products Corp.
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FRINK SNO-PLOWS

Both "V" TYPE and
ONE WAY BLADE TYPE
hand or power hydraulic control
FOR ALL MOTOR TRUCKS
FROM 1½ to 10 TONS

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Revolutionary NEW washing method
for Automotive and Industrial Clean-
ing.

A real money-saver and money-
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Write for further information.

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DITZLER COLOR DIVISION
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Exceptionally good workability and simplicity of application have made Ditzler DQE Enamel the long-time favorite of repaint men. DQE Enamel is famous for fast setting—brilliant lustre—firm adhesion—outstanding durability.

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"ATTENTION WHITE OWNERS"

Make old crankshaft pulleys stay tight on worn shafts by a special bushing and puller combined. Easy to install and remove. No driving. Any lathe hand can make it. Tried and approved by a large fleet owner. Satisfaction guaranteed on all models. Complete plans \$5.00. Address Jarvis Brothers, Mechanical Research Division, R. D. 2, Finleyville, Pa.

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Cleaner Oil
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Conserves Engine Life
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Michigan City
Indiana

MICHIANA OIL FILTERS

FOR ENGINE BEARINGS
CLUTCH PLATES AND PARTS
CHASSIS PARTS

Monmouth
TRADE MARK
is the name



WILLIAMS
SUPERWRENCHES • SUPERSOCKETS

J. H. Williams & Co., Buffalo 7, N. Y.
"The Wrench People"

Trailer Makers

(CONTINUED FROM PAGE 68)

to brake-operating valves is diminished.

Another problem was presented by an operator who had had a costly experience with a failure in a wheel chamber which was beyond the control of all valve equipment. Under this condition air pressure was quickly lost when brakes were applied, leaving both truck and trailer without brakes. By reducing the aperture on the air intake to the trailer tank without affecting the speed of emergency braking, a condition was created wherein all lines to trailer wheels may be broken without loss of air except during actual brake application. And if the brake application is attempted, the loss of air pressure from the truck tank is so reduced as to require almost a full minute to become impotent. Not just a minute in time but a minute of brake application. Mr. Seale pointed out that since 60 mph is 88 ft a second, sometimes 20 seconds can be a long time.

Still another development was revealed by Mr. Seale. Under present conventional arrangements, he explained, the trailer brakes go into emergency operation if the air supply to the trailer is broken. But if the control or service line to the trailer is broken the emergency application is not made and it is then not possible for the driver to operate the trailer brakes. Applying the truck brakes under this condition might result in a costly jackknife. Work has been done on this problem, according to Mr. Seale, to the point where a service line valve has been developed and successfully tested in the laboratory. With this unit, if the service line to the trailer is broken, any attempt to apply the brakes will close the air supply line to the trailer to prevent loss of air from the truck and will also put trailer brakes into emergency operation. An operating model of the unit will be road-tested in about 30 days.

Seven Resolutions

IN a series of resolutions passed at the business session, the Association

1. Emphasized to Congress and Federal officials the dangers of arbitrarily limiting supplies of trailer materials, especially steel, in the voluntary allocation program;

2. Resolved to broaden the scope of its public relations activities and work in harmony with motor carriers and their associations in furtherance of their highway safety and courtesy program;

3. Called for the repeal of automotive excise taxes in the present session of Congress;

4. Urged the planners of European aid to consider the advantages of trailers and to develop the art of transportation abroad along the same lines which have proved successful in the United States;

5. Promised to aid the National Defense Program, particularly in design engineering;

6. Endorsed the principle of Federal and State labor-management laws recently en-

(TURN TO PAGE 222, PLEASE)

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2-AXLE DRIVE

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When you call for
DURO CHROME
you're sure of getting



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Good
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DURO METAL PRODUCTS CO.
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CAMPBELL
Lug Reinforced
TIRE CHAINS
THE CHAIN WITH THE SAW-TOOTH GRIP

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**Pre-Insulated
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THE PIONEER COMPANY
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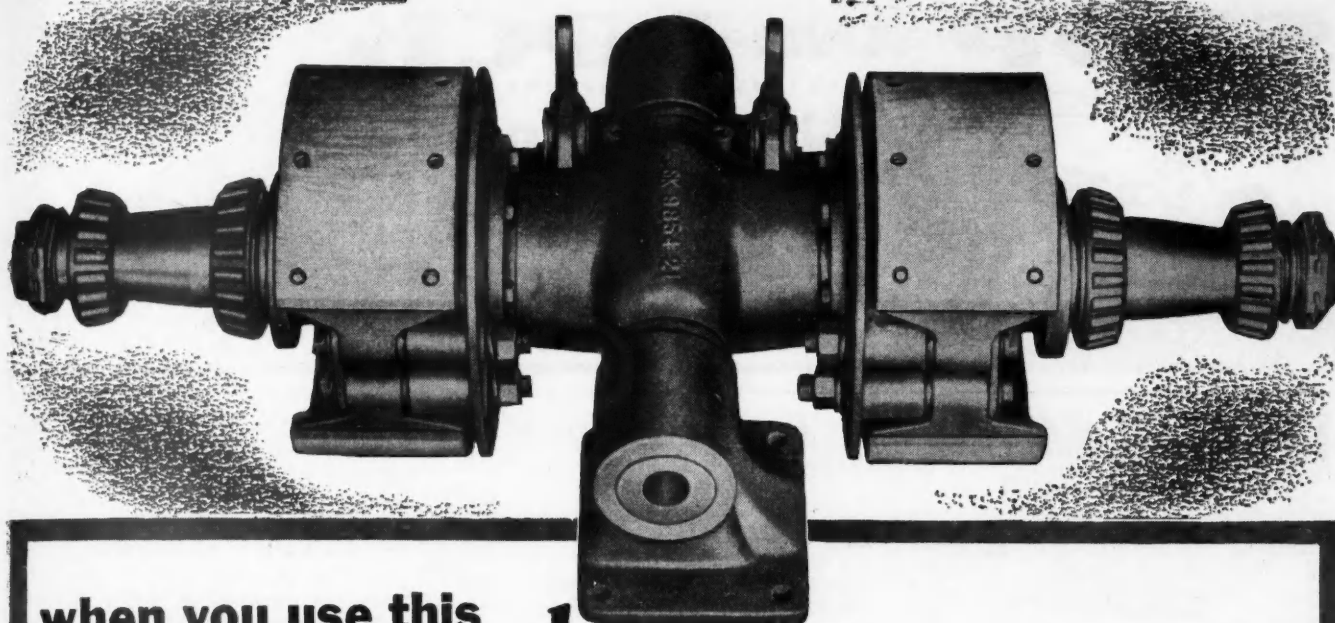


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Improved
Landing Gear

Load Lifting power unequalled by any other type. 6" more ground clearance than other types. Fast, easy operation.

SAFE — SIMPLE — DURABLE

HOLLAND HITCH COMPANY
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Standard TRUNNION AXLE

Heavy Hauling Problems Vanish!..

- Perfects low bed trailer performance
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- Adds years to life of trailer
- Makes possible lower frames—for easier loading

Make a decisive move towards low maintenance costs and a high degree of satisfaction by specifying Standard Trunnion Axles. Axle alignment maintained by wider spacing of frame bearings, making for lower upkeep costs and greater strength. Compactness of design enables use of eight wheels in line, within minimum space, allowing removal of inner tires without removal of axle from the trailer. Also makes possible lower trailer frames for easier loading and greater strength. *Write, wire or phone today for complete information.*



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HYDRAULOCK

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KINNEAR Rolling Doors



On truck bodies or buildings, Kinnear Doors are efficient, dependable, economical. Steel-slat curtain coils upward, out of way. Any size; motor operation if desired. Write for details.

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Chains—88 Ft.

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We have Users in your City
Ask us Who—
And get our prices.

REFILL FILTER CO.

120 Rhode Island Ave., East Orange, N. J.

Trailer Makers

(CONTINUED FROM PAGE 220)

acted and pledged to help bring about their successful administration;

7. Opposed President Truman's high budget figures, called for governmental economies, and urged tax reduction.

Buhner Predicts Bright Future

SPEAKERS were featured at the three days sessions. Ed. J. Buhner, president of the American Trucking Associations, Inc., noted a "clearly marked" trend to truck transportation during the last two decades and predicted this trend will be accelerated during the next decade because of a rapid population growth and a movement toward decentralization of business and life from city to suburbs.

"While other forms of property transportation may suffer and I think will suffer substantially from the decentralization," Mr. Buhner said, "I know for certain that highway transport will benefit. We are completely flexible. No longer do producers and distributors have to hug the center of cities, and build their plants along rail lines or sidings."

Highway Planning

P. D. McLEAN, assistant director of the National Highway Users Conference, said that long range state highway planning is "the highway user's answer to the highway 'promoter' who wants all the emphasis put on building of highways and little or none on how they can be reasonably financed. Our problem is to find out which roads most need improvement and how we can pay for the job without taxing some drivers off the roads."

L. C. Allman, vice president of the Frue-

hauf Trailer Co., declared that the public is being deprived of the full use of existing highways because of hodge-podge state vehicle size and weight laws.

"It is about time," Mr. Allman said, "to stop this business of accepting any old vehicle size and weight figures because they happen to represent a little increase in what the present state laws may be. Let us liberate roads and streets from strangulation by ultra-conservative highway measures and from danger of prostration by unwarranted financial burdens."

(TURN TO PAGE 224, PLEASE)

America's Leading HEAVY-DUTY
TRUCK Manufacturers Standardize

ON **LIPE**
CLUTCHES

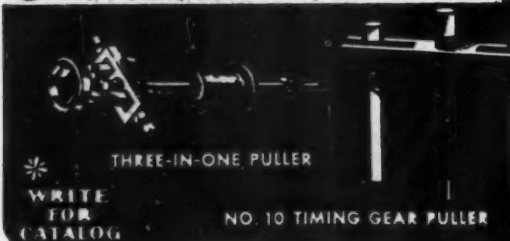


★ for more miles between
teardowns
★ for less wear and tear
on the truck!
★ for easier maintenance
and replacement!

LIPE-ROLLWAY CORP.
SYRACUSE, N. Y.

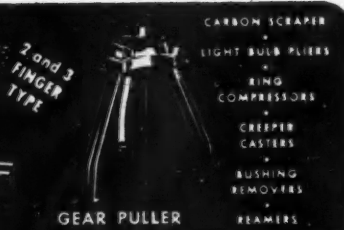
**OVER 70% OF ALL
MAKES OF TRUCKS
AND BUSES ARE
Zollner EQUIPPED**
ZOLLNER
HEAVY DUTY PISTONS

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* **THREE-IN-ONE PULLER**
WRITE
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NO. 10 TIMING GEAR PULLER



GEAR PULLER

Cal-Van
MACHINE PRODUCTS, INC.
JACKSON, MICHIGAN U.S.A.

**ENGINEERED and
IDENTIFIED PARTS**
Wohlert
CORPORATION
LANSING 5, MICHIGAN

"Profit earners for *your* shop"

handy, reliable

K-D TOOLS

Write for free
copy of latest
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K-D MANUFACTURING CO., LANCASTER, PA., U.S.A.

• HAMILTON, ONTARIO, CANADA

HAVING GLASS TROUBLE?

We can solve your problems with hard to break, shatter-resistant PLEXIGLAS®, the clear plastic which is becoming increasingly popular for truck and car doors. It will last the life of the vehicle when properly handled.

The use of PLEXIGLAS in motor vehicle glazing has been permitted in some states and should be checked with your state inspector.

Year	Make	Net Price
41-47	Ford Door	\$8.45
41-47	Chev. Door	7.85
48-47	Dodge Door	7.85
37-47	(EH) Mack Door	10.19
37-47	LFT Mack Door	12.45
41-47	White Door	8.45
39-47	G.M.C.	7.85
41-46	Studebaker	5.40
37-47	International	8.83

Others \$2.75 to \$12.50. Prices on request.

Terms C.O.D. or cash with order, F.O.B. Aberdeen

ABERDEEN AUTO PARTS

Box 283-C Aberdeen, Md.
Phone Aberdeen 258

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Rohm & Haas Company.

AUTOPULSE ELECTRIC FUEL PUMP

- Used in any car or truck
- No vapor lock
- Instant starting
- No stalling in traffic
- Greater fuel economy
- Added protection



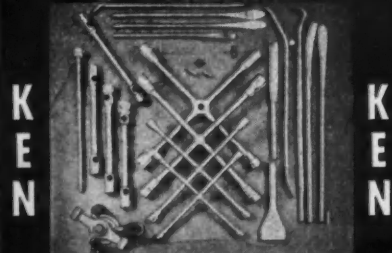
AUTOPULSE CORP., LUDINGTON, MICH.

DAYTON Spoke Type Steel WHEELS AIR-COOL BRAKE DRUMS AND TIRES

FOR TRUCKS, TRAILERS AND BUSES.
THE DAYTON STEEL FOUNDRY CO.
DAYTON, OHIO

DESIGN LATEST QUALITY UNQUESTIONED

SEE YOUR LOCAL JORREX



KEN-TOOL MFG. CO. AKRON, O.

LARGEST EXCLUSIVE MFG.'S OF SPECIALIZED
WHEEL AND TIRE CHANGING TOOLS
KNOWN AND USED AROUND THE WORLD

Trailer Makers

(CONTINUED FROM PAGE 222)

No Substitute for Courtesy

WALTER W. BELSON, director of Public Relations for the American Trucking Associations, Inc., reminded the industry that "there is no substitute for actual courtesy and safety on the part of truck drivers. They are the trucking industry, so far as the public is concerned, every time they roll out into the streets or highways. No amount of publicity, no breast-beating in print or over the air, no loud protestations of virtue can influence the opinion of a man formed through an unhappy personal experience with a truck. There is only one formula for meeting this problem. That is to step up our safety activities as an industry to a point not heretofore reached. That should be the program of everyone with a direct or indirect interest in the trucking industry's welfare.

President's Report

IN the president's annual report, outgoing association president Julius L. Glick, of Truck Engineering Corp., said that the industry had had a good year in 1947, producing 55,000 motor, freight vehicles. This output fell short of the 1946 total but was far ahead of the prewar record of 41,869 units produced in 1941. He pointed out that the industry's products were brought to customers at prices which were only about 17 per cent above the prewar level, in contrast with an average jump of 71 per cent in prices of all manufactured goods.

Officers and directors elected for 1948 are as follows: President, Harrison Rogers, Rogers Bros. Corp.; western vice president, John C. Bennett, Utility Trailer Mfg. Co.; eastern vice president, J. Cottrell Farrell, Easton Car & Construction Co.; treasurer, W. E. Grace, Hibbs Mfg. Co.; directors, L. C. Allman (Fruehauf), Bert P. Bates (Highway), F. A. Schotters (Trailmobile), R. C. Tway, Jr. (Kentucky), E. J. Ziegler (Keystone), C. A. Persinger (Wilson), L. A. Myers, Jr. (Black Diamond), Christopher Hammond, Jr. (Steel Products), J. L. Glick (Truck Engineering).

END

(Please resume your reading on P. 71)

J. H. JENKINS DIES

J. H. Jenkins, 49, district manager for The Autocar Co. at Charlotte, N. C., died Jan. 17 in that city following an operation.

BETTER than Ever Before



Repower with

RAMCO

10
up

PISTON RINGS

Permalux FINER DECALCOMANIA

FIRST IN { APPEARANCE
ECONOMY
DURABILITY

Made With DuPont "DULUX"

Write Today for details

THE PERMALUX COMPANY

500 Rathbone Ave. • Aurora, Ill.

Better—but not
more expensive!

SHULER AXLES

SHULER AXLE CO.
LOUISVILLE, KY.

DUNK 'EM IN GUNK H-S

COMPLETE DECARBONIZING
PROCESS
IN PACKAGE FORM

IMMEDIATE DELIVERY
1 GALLON OR A
TANK CAR

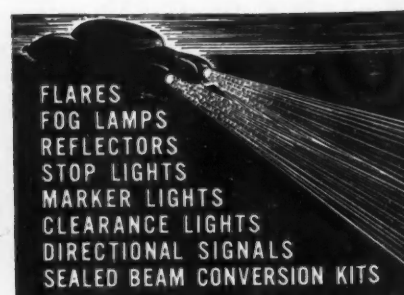
CURRAN CORP. LAWRENCE, MASS.



SPEAKER TUBE AND TIRE REPAIRS

One Reliable Source for all your needs
Electromatic Vulcanizer • Match Patch Vul-
canizer • Match Patches • Electro-Patches
• Rubber Rivets • Replacement Valves •
Electro-Timer • Casing Patches • Convertible
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Kits • Solvents • Beveled Patches.

J. W. SPEAKER CORP. • Milwaukee 12, Wis.



ARROW SAFETY DEVICE CO.
MOUNT HOLLY, N. J.

TO WEIGHT-SAVING ECONOMY

ADD

"NO DETERIORATION"
"PROMPT DELIVERY"

ESCHENBACH & RODGERS, Inc.

HAULING CONTRACTORS
520 N. SEVENTH AVE.
SCRANTON 3, PA.

October 7, 1947

Reynolds Metals Company
Truck & Trailer Div. (Plant 14)
Louisville, Kentucky

Gentlemen:

In June of this year we purchased four Reynolds all aluminum bodies through the Campbell Body Works, Olyphant, Penna. These bodies are 16 feet long and 7½ feet wide and are equipped with a ¼" aluminum diamond tread plate flooring.

Three of these trucks have been equipped with an Anthony Hydraulic Tail Gate and are used in the delivery of Jane Parker Bakery Goods to A & P Stores in lower New York State. These trucks have traveled in the past four months 24,480 miles, or 255 miles per day for six days a week. They have not deteriorated one iota in appearance during this mileage and cannot be distinguished from a truck just out of the factory.

The other truck has been used in the delivery of groceries, produce and bakery products to various A & P Stores, and like the three mentioned above, is still a brand new truck, despite the fact that 25,340 miles have been traveled in four months.

Another feature of the Reynolds all aluminum body with Anthony Tail Gate and chassis is that the overall weight is but 9700 lbs.

At the present time you cannot buy a truck body within a radius of 135 miles from Scranton in less than three months delivery, whereas we have given our order on Tuesday for the Reynolds Body through the Campbell Body Works and delivery was made on Saturday, just four days later. This immediate delivery still obtains.

We cannot praise the Reynolds aluminum body too highly and we are looking forward to years of steady usage.

Yours very truly,

ESCHENBACH & RODGERS, INC.

By *Hugh J. Rodgers*
Hugh J. Rodgers

Assembly from stock parts. For name of nearest distributor write Reynolds Metals Company, Truck & Trailer Division, 2000 South Ninth Street, Louisville 1, Ky.

"THE LIGHTWEIGHT
CHAMPIONS OF THE ROAD"

IF YOU SEE RUST
YOU KNOW IT'S NOT
ALUMINUM



REYNOLDS ALUMINUM TRUCK BODIES



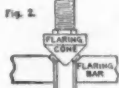
IMPERIAL Double-Flaring Tool

... for
steel
and other
metal
tubing



● Ideal for brake, gas and oil line work. Overcomes tendency of welded steel tubing to crack when flared with ordinary flaring tool. First, tubing is belled, Fig. 1. Then flared in conventional manner, Fig. 2.

No. 93-FB Double-Flaring Tool complete in metal kit.



Order From Your Jobber

THE IMPERIAL BRASS MFG. CO.
1209 W. Harrison St., Chicago 7, Ill.

NEW LOW COST DRILL GRINDER

Anyone can do expert drill grinding with this simple-to-use drill grinding attachment—fits on any bench grinder—saves buying new, twist drills—saves time and materials that dull bits waste. Grinds bits from 3/16 to 1 1/4.

WRITE
for FREE
literature.



T & H MFG. CO.
811-N East 31st St. C., Mo.

CRACKED BLOCKS?

SAVE cracked BLOCKS and HEADS with ZO-TITE Blocksealer. Either in or out of chassis.

This new metallic powder treatment repairs cracks with a HARD, METALLIC, CHEMICAL-WELD. Once set, will last forever. Functions safely with anti-freeze. (Will not work on radiators) Test it on a tough job. Write for free sample on your letterhead.

Sold by jobbers.

THE ZO-TITE PRODUCTS CO.
Dept. CC, Ozone Park 16, N. Y.



SELF-CLOSING MONKEY LINK



Trade Mark Reg. U.S. Pat. Office

MONKEY LINKS

Fit all types
of Tire Chains.
Made in 5 sizes.

Order them
today.

FLOWER CITY
SPECIALTY CO.
Rochester, N. Y.

Introducing

(CONTINUED FROM PAGE 96)

...CHARLES W. SELF, PAUL R. WARREN, and JOHN MACKSEY as new zone sales managers for The General Detroit Corp. with headquarters in Cincinnati, Boston, and St. Louis, respectively.

...A. J. NELSON as manufacturer's agent in the Rocky Mountain area for Kold-Hold Mfg. Co., Lansing, Mich.

...ROBERT KLARE as manager of Federal-Mogul Corp.'s Greenville, Mich., plant, and ELMER PETT as works manager of the St. Johns, Mich., plant.

...ROBERT E. CARBAUH as sales manager of a new department for the development and promotion of fire control equipment by Titeflex, Inc., Newark, N. J.

...A. A. LUNDGREN as Burd Piston Ring Co. representative in southern California, Arizona, and Clark County, Nevada, with headquarters in Fontana, Calif. FRED P. RAPP covers the northern California territory and the balance of Nevada from headquarters in San Francisco.

...A. E. KRASICK of Minneapolis, as national field supervisor of the Spark Plug Division, Hastings Mfg. Co.

...W. FRANKLIN MEYER and ROBERT J. CLARKE as divisional managers for Hastings Mfg. Co. with headquarters in Houston, Texas, and Chicago, respectively.

...W. F. NEWBERRY as assistant director of sales, Detrex Corp., Detroit, and LeROY CAMEL as new sales manager of the Industrial Products Division.

...CLARENCE S. BEESEMYER and PHILIP S. MACRUDER as executive vice-presidents, the General Petroleum Corp., Los Angeles.

...DAVID C. LEGAULT as assistant sales manager of Airtex Automotive Division, Chefford Master Mfg. Co., Inc., Fairfield, Ill.

...EDWARD QUEKELS as director of the newly-created product development and service department of Bear Mfg. Co., and WALTER V. HALL as sales manager.

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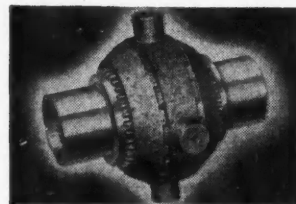
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Pedrick
precisioneered

PISTON RINGS

in guaranteed
ENGINEERED SETS

For every Car, Truck,
Bus and Tractor

NoSPIN Differential



Provides greater traction, greater driving safety, less tire wear. Easily installed in your truck axle.

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Automotive Sales Office: Middletown, N. J.

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Dependability and Performance Mean

QUICK STARTS

LONG LIFE

LOW COST PER MILE



Willard Heavy Duty Transport Batteries

Designed particularly to withstand severe vibration and cycling service in commercial applications. Heavy plates. Sturdy hard rubber containers. Willard Safety-Fill Construction. Willard Rubber Insulation and glass fibre retaining mats for severe, high mileage service. Selected wood separators and glass fibre retaining mats for normal service.

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YOU GET MORE WORK DONE WITH FWD TRUCKS

THEY SPEED CONCRETE MIXING AND HAULING AT LOW COST



Keeping mixers on the move between central mixing plants and pouring points, speeds operations — makes more money for you. So does a mixer that has FWD four-wheel-drive power and traction to maneuver fast and safely on the job — even when

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Mount your mixers on FWD four-wheel-drive trucks and you have what it takes to keep going — up and over steep grades, through loose sand or sticky gumbo, over rough

and rocky ground, working on or off the road. You speed all operations — you get more work done, more profitably — with mixers mounted on FWDs.

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WORLD-WIDE SALES and SERVICE

America's Foremost Heavy-Duty Truck

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